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“The Society will not be responsible for the accuracy of the statements or conclusions contained in the several papers in the Journal, the authors themselves being solely responsible.”

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Binding of Back Volumes of the Journal.

THE Journal is issued this year to Governors and Members bound in paper covers, and Messrs. TRUSCOTT & SON have contracted to bind this and back Volumes to match the Bound Volumes issued by the Society from 1901-04, and 1912-14, at the rate of 2s. 6d. per Volume, and to supply the green cloth lettered cases, for the use of local bookbinders, at the price of 1s. 6d. each, post free, or 1s. 3d. each if called for at their offices. Cases cannot, however, be supplied separately for the Volumes of the First and Second Series, 1839 to 1889.

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To avoid confusion the Volumes of the Journal have been re-numbered from the beginning, and the following Table shows both the Old and the New Numbers of each of the Volumes which have been issued since the first appearance of the Journal in 1839 :—

NEW NUMBERS	OLD NUMBERS	NEW NUMBERS	OLD NUMBERS
FIRST SERIES		SECOND SERIES—continued.	
Vol. I. (1839-40) ...	Vol. I. Parts I. (I.), II. (II.), III. (III.), and IV. (IV.)	Vol. 44. 1883 ...	Vol. XIX. Parts I. (xxxvii.) & II. (xxxviii.)
2. 1841 ...	II. I. (v.) II. (vi.) & III. (vii.)	45. 1884 ...	XX. I. (xxxix.) and II. (xl.)
3. 1842 ...	III. I. (viii.), II. (ix.) & III. (x.)	46. 1885 ...	XXI. I. (xli.) and II. (xlii.)
4. 1843 ...	IV. I. (xi.) and II. (xii.)	47. 1886 ...	XXII. I. (xliii.) and II. (xliv.)
5. 1844 ...	V. I. (xiii.) and II. (xiv.)	48. 1887 ...	XXIII. I. (xlv.) and II. (xlvi.)
6. 1845 ...	VI. I. (xv.) and II. (xvi.)	49. 1888 ...	XXIV. I. (xlvii.) and II. (xlviii.)
7. 1846 ...	VII. I. (xvii.) and II. (xviii.)	50. 1889 ...	XXV. I. (xlix.) and II. (l.)
8. 1847 ...	VIII. I. (xix.) and II. (xx.)	THIRD SERIES	
9. 1848 ...	IX. I. (xxi.) and II. (xxii.)	Vol. 51. 1890 ...	Vol. I. Parts I. (1), II. (2), III. (3), and IV. (4)
10. 1849 ...	X. I. (xxiii.) and II. (xxiv.)	52. 1891 ...	II. I. (5), II. (6), III. (7), and IV. (8)
11. 1850 ...	XI. I. (xxv.) and II. (xxvi.)	53. 1892 ...	III. I. (9), II. (10), III. (11), and IV. (12)
12. 1851 ...	XII. I. (xxvii.) and II. (xxviii.)	54. 1893 ...	IV. I. (13), II. (14), III. (15), and IV. (16)
13. 1852 ...	XIII. I. (xxix.) and II. (xxx.)	55. 1894 ...	V. I. (17), II. (18), III. (19), and IV. (20)
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19. 1858 ...	XIX. I. (xli.) and II. (xlii.)	61. 1900 ...	XI. I. (41), II. (42), III. (43), and IV. (44)
20. 1859 ...	XX. I. (xliii.) and II. (xliv.)	62. 1901 ...	Issued as an Annual Bound Volume.
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36. 1875 ...	XI. I. (xxi.) and II. (xxii.)		
37. 1876 ...	XII. I. (xxiii.) and II. (xxiv.)		
38. 1877 ...	XIII. I. (xxv.) and II. (xxvi.)		
39. 1878 ...	XIV. I. (xxvii.) and II. (xxviii.)		
40. 1879 ...	XV. I. (xxix.) and II. (xxx.)		
41. 1880 ...	XVI. I. (xxxi.) and II. (xxxii.)		
42. 1881 ...	XVII. I. (xxxiii.) and II. (xxxiv.)		
43. 1882 ...	XVIII. I. (xxxv.) and II. (xxxvi.)		

(The numerals within brackets indicate the numbers as printed on the several Parts of each Series.)

NOTE.—Owing to the need for economy in the use of paper, to the difficulty under which all printing work is being carried out, and to the fact that many of those from whom contributors are drawn are engaged with H.M. Forces or upon work connected with the war, the Council have thought it expedient somewhat to curtail the number of special articles in this issue of the Society's *Journal*.

In consequence of the exceptional conditions arising out of the war the Council found it necessary to cancel the holding of the Annual Show in 1917, but decided that as soon as the condition of the country would permit the next Show should be held at Cardiff. (See Minutes of the Council Meeting on December 6, 1916, printed in the Appendix.)

C. ADEANE,
President.

JOURNAL

OF THE

ROYAL AGRICULTURAL SOCIETY

OF ENGLAND.

ON MAKING AND STORING FARMYARD MANURE.

OF all the manures and fertilisers now available farmyard manure is by far the most popular, the amount used much exceeding that of all other fertilisers put together both in weight and in value. The actual production can only approximately be estimated, because most farmers have no exact record of how much they make, but it can be arrived at as follows: it is estimated that $9\frac{1}{2}$ million tons of straw were grown in 1913-14 in the United Kingdom; if we suppose that all this goes back to the land, and further that one ton of straw makes four tons of manure, then the amount of farmyard manure produced would be 37 million tons. The amounts used of other manures

and fertilisers are far below this high figure. Prior to the war they were estimated as follows :—

	Estimated pre-war consumption in United Kingdom, tons per annum	Estimated annual value Pre-war prices
Farmyard manure	37,000,000	11,000,000
Nitrate of soda	80,000	920,000
Sulphate of ammonia	60,000	750,000
Cyanamide (nitrolim) and nitrate of lime	10,000	110,000
Superphosphate	600,000	1,650,000
Basic slag	280,000	560,000
Guano	Say ¹ 25,000	250,000
Bones	Say ¹ 10,000	200,000
Others	Say ¹ 10,000	100,000
Total	1,105,000	1,510,000

¹ No good estimate can be made of the amount of guano, bones, and other materials used as fertilisers.

Thus the farmer makes nearly two tons of farmyard manure for every hundredweight of artificial manures he uses, and he spends two and a half times as much on farmyard manure as he does on artificials.

Seeing that farmyard manure plays so much more important a part on the farm than any other fertiliser it obviously ought to be made and used in the best possible manner. But unfortunately this is far from being the case. On an average not more than half the full value is obtained. The tables for the estimation of the unexhausted values drawn up by Hall and Voelcker, and generally adopted by valuers, are based on the assumption that half of the nitrogen in the manure will probably be lost. Nor is this country alone in offending. The American Department of Agriculture estimates the value of the farmyard manure produced in the United States at more than 2,000 million dollars, *i.e.*, more than 100,000,000/., of which more than one-third is wasted.¹

Since, therefore, the problem involves such great sums of money, and affects every individual farmer, it is obviously an important one for the agricultural chemist. Investigation, however, is by no means easy; farmyard manure is variable in composition and extremely difficult to sample and to analyse satisfactorily; also it undergoes a very complex series of

¹ *Farmers' Bull.* 21, U.S. Dept. of Agric., 1894. The basis of estimation differs from ours, so that no strict comparison can be made. The figure is arrived at by assuming that all the beasts are kept under cover all the year, and shows what might be obtained in these conditions.

changes in the heap. For this reason chemists have rather left it alone, and for many years past only three or four investigators have dealt with it in this country.

Through the generous assistance of the Hon. Rupert Guinness, C.M.G., it has been possible to investigate the problem at Rothamsted during the past three years, and the results both of field trials and laboratory experiments are recorded here.

HISTORICAL.

The art of managing a manure heap goes back to the very beginnings of agriculture; it was already old when history began, and the first writers who gave any agricultural details have a good deal to say about it. Varro,¹ writing about 40 B.C., insists upon two points: first, that the manure should be rotted before use, and therefore that there should be two heaps—one fresh and one rotted; secondly, that the heaps should be kept moist by allowing water to run in, and also by protecting their sides from the sun by twigs and leaves, “for the sun must not suck out beforehand the goodness which the earth requires.” Columella, about A.D. 90, amplifies Varro, and gives details for constructing the place or pit where the manure is to be kept,² and for turning the manure in summer time to facilitate rotting. This rotted manure was needed for the corn, while the fresh manure, which was stronger, was used for grass. He suggested that the manure from different kinds of beasts should be kept separately, but if corn only was being grown there was no necessity for this. Thus three guiding rules were laid down:

- 1.—The manure must not be allowed to become dry;
- 2.—It must be rotted before being applied to corn;
- 3.—If possible the different kinds of manure must be kept separately.

Neither Varro nor Columella had anything to say about the bad effect of rain on the manure heap; their whole concern was to prevent it getting too dry. No doubt in Italy the heap was more likely to suffer from sun than from rain. In England and North Europe the case was different, but as agricultural teaching was taken from the Latin writers no account seems to have been taken of this difference, and we can find no particular recommendation to guard against rain. It is impossible to estimate how much was lost to mediæval man by the strict adherence to the instructions of Columella in spite of the difference in conditions between Roman and North European husbandry.

¹ Varro: *Rerum Rusticarum*, lib. 1, cap. 13.

² Columella: *Rerum Rusticarum*, lib. 2, cap. 15. “With bottom shelving in the manner of ponds, well built and paved, that the moisture shall not pass through, for it is of great importance that the dung retain its strength by the juice of it not being dried up.”

And so it happens that William Ellis, the farmer writer of Little Gaddesden, Herts, was driven in 1731¹ to condemn utterly the common plan of throwing out all dung in separate little heaps in the farmyard, and leaving it there exposed to the wash of the rain. All these heaps, he says, should be mixed together and kept under cover to protect them from the weather, or failing a suitable covered place "then as the Beast Dungs are made they should be lain in one great heap or Dung Hill, which, next to Cover, will preserve their good Properties in a great Measure from the Power of Rains and Droughts: and, as the black Water drains from it, it ought to be carefully preserved, by causing it to run into such a Receptacle or Reservoir, as will give the Farmer an opportunity to carry it out in a Tub or Barrel, for throwing it over the Dunghill, or to scatter it over Plowed or Grass land."

Other writers, Mortimer,² one of the most polished agricultural authors of the time, and later on Donaldson,³ and others add little except that the heap should be covered with earth if no other shelter is available.

In the experimental period at the end of the eighteenth century the first point to be attacked was the question of rotting the manure. So long as it was applied to wheat in the large quantities common at the time,⁴ some preliminary rotting was needed to kill the weeds, but with the introduction of hoed or fallow crops this procedure became unnecessary. A number of farmers pointed out in the *Annals of Agriculture* that the fresh dung drawn straight from the beasts and applied to these cultivated crops gave better results than rotted dung.⁵

The ancient rule about the need for rotting dung was thus seen to be without foundation; it was further demolished by the agricultural chemists of a later time.

The next notable advance was made about 1800 by von Thaer, the most distinguished agricultural chemist of his day. He made actual laboratory experiments with manure: they were only on a small scale, but they were the best of their kind up till then. They showed that air caused loss of manure, and therefore von Thaer supported the practice, which was known,

¹ Wm. Ellis. *The Modern Husbandman* for the month of November, pp. 67 *et seq.*, in the 1743 edition

² J. Mortimer: *The Whole Art of Husbandry*, 1707, page 123 in the 6th edition, 1761.

³ James Donaldson *Modern Agriculture, or the present state of husbandry in Great Britain*, 1796, pp. 26, 245 *et seq.*

⁴ Eighteen to twenty-four cartloads, each containing 16 to 18 cwt per statute acre, according to Donaldson

⁵ These papers are summarised by Young in his interesting "Essay on Manure," *Bath Soc. Papers*, Vol. 10, 1801 See also Young's *Farmers' Calendar*, Art "Manure."

but not common, of allowing bullocks or carts to run over the heap, and thus compress it, and also of covering it with earth.

MANURE AND FOOD.

The greatest advance, however, was made by the distinguished French chemist Boussingault, who discovered the connection between food and manure, and thus laid the foundation of the modern method of dealing with the problem. Boussingault was the first to realise that manure is simply the part of the animal's food which it neither breathes out nor retains in its body as flesh or milk. This idea has subsequently been developed by physiologists, and has led to some highly important results.

In order to appreciate these results we have to look upon the animal as a huge tube with thick walls and open ends, one end being the mouth and the other the anus, while the walls form the animal's body. Food is taken into the tube through the mouth, but although inside the tube it is still virtually outside the body, and it cannot enter until it has been broken down by the various digestive fluids and changed to something simple and soluble. Material that for any reason cannot be broken down in this way is not taken up, and simply passes on to be excreted as the solid faeces.

On the other hand, the material that is dissolved or digested can pass through the wall into the animal's body, where it undergoes further changes, some being built up into body substance, meat, &c., some made into milk, some oxidised and breathed out as carbonic acid and water, and some passes out into the urine.

We have, therefore, to distinguish two kinds of excretions, the solid faeces, representing the undigested material that the animal cannot deal with, and the liquid urine, representing the digested material dissolved, assimilated, and then passed out by the animal.

A number of experiments have been made to determine the extent to which the animal utilises his food; the most complete are those by Kellner, who has been able to draw up a balance sheet showing how much of the food is used in the different ways. One of his experiments gives the following results:—

Balance Sheet for fattening Oxen. Kellner.

CARBON.				NITROGEN.			
In food	5574.5	In faeces	. 1609.6	In food	186.5	In faeces	. 106.6
		In urine	. 170.9			In urine	. 72.7
		In flesh	. 682.5			In flesh	. 7.2
		Breathed out	3111.5			Breathed out	Nil
Total	5574.5		5574.5	Total	186.5		186.5

Carbon forms nearly half the total dry matter of the food, but a great deal—nearly three-fifths—of what is supplied to the animal is oxidised and breathed out as carbonic acid. This is essentially a combustion, and furnishes the animal with his chief source of energy. Of the remainder a considerable amount gets into the faeces in the undigested material; some is laid up in the flesh, and only a small amount appears in the urine. The nitrogen balance sheet, however, is quite different. The amount in the food is, of course, very much less, but none is breathed out and very little is laid on in the flesh; practically all of it appears in the faeces or urine. In this particular experiment 106·6 parts were in the faeces and 72·7 in the urine; but with a richer and more digestible diet a larger proportion appears in the urine.

The case becomes a little more complex with dairy cattle, because some of the nitrogen passes into the milk. Even here, however, the great bulk of it appears in the excretions.

The same rule applies to the potash and phosphoric acid in the food. Most of the potash appears in the urine and most of the phosphoric acid in the faeces even in the case of dairy cattle in full milk. Sweetser¹ obtained the following distribution for every hundred parts fed:—

Distribution of nitrogen, potash, and phosphoric acid of food by Milking Cows.

	In faeces	In urine	In milk
Nitrogen	31	52	17
Potash	15	75	10
Phosphoric acid	75 5	1 5	23

Finally it has been shown that the substances in the urine possess considerably more fertilising value than those in the faeces. The reason is that the faeces, *i.e.* the material resistant to the attack of the dissolving agents in the animal's body are also resistant to the dissolving agents in the soil. Now plants, like animals, must have their food dissolved before they can take it up, and therefore the solid faeces are only of value to them in so far as they can be dissolved in the soil. On the other hand, the substances in the urine are already dissolved, and therefore of greater value as plant food. This has been proved also by direct pot experiments. Thus Aebv, the Belgian agricultural chemist, found in 1892 that if the nitrogen in nitrate of soda was valued at 100, the same amount of nitrogen in urine would be worth 92, and in solid

¹ *State Coll., Pennsylvania, Rpt.*, 1900, 321.

fæces only 40. The experiment was done in rather a different way by Voorhees and Lipman¹ in New Jersey, but the same result was obtained: the solid manure alone gave an increase of 136 while a mixture of solid + liquid together containing the same quantity of nitrogen gave an increase of 222:—

Voorhees' and Lipman's experiments with Wheat, New Jersey, 1906.

	Dry matter produced	Nitrogen in crop	Nitrogen recovered
	grms.	grms.	Per cent.
Control	98	0.75	—
Solid manure containing 4 grms. of nitrogen	234	1.80	26
Solid + liquid together contain- ing 4 grms. of nitrogen	320	2.49	44

These experiments show that the liquid urine has considerably more fertilising value than the solid fæces.

Without going into further details we can sum up this physiological part of the investigation as follows:—

1.—Only small amounts of the nitrogen, phosphorus and potash in the food are retained by the animal; he lives mainly on the carbon and oxygen of the food, and passes out the bulk of the manurial constituents into his excretions.

2.—A good deal of the nitrogen is taken up by the animal, but not kept; it passes out in the urine and becomes a rich plant food.

3.—The more digestible the food the greater is the amount of nitrogen thus taken up and excreted, *i.e.* converted into plant food.

4.—There is no loss of nitrogen, potash or phosphoric acid in the animal, and an exact balance sheet can be made up. If the amount and composition of the food is known the amount and composition of the excretions can be calculated by simple arithmetic.

All these propositions have been fully and completely demonstrated; but the simple arithmetical calculation that succeeds in the laboratory has a way of breaking down in practice, and this particular one is no exception. Numerous experiments have shown that the calculation only comes out right when the urine and fæces are collected separately. The only way of doing this is to put a harness on the animal, attach a bag to collect the fæces, and a funnel and tube to

¹ *New Jersey Expt. Stat. 27th Annual Report, 1906, 171.*

allow the urine to run into a tank. With these appliances the full amount of manure is obtained, and it has its full value; there is no loss; the amount actually collected is equal to the calculated amount.

It is obvious that this laboratory method for obtaining full value out of the manure could not be adopted on the farm. In ordinary practice the urine and fæces have to be collected together, and the urine is not run into a tank; the best substitute is to absorb it by litter. This then introduces a new factor, the efficiency of the litter as an absorbing agent, which determines the extent to which the urine will be saved. As nothing is ever perfect we must expect loss here. Further experiments show that fermentations and decompositions are liable to set in directly urine and fæces are exposed to the air. We must therefore add a fifth conclusion to the previous four:—

5.—The composition of farmyard manure depends on the animal, the food, and the losses in making and storing.

THE COMPOSITION OF FARMYARD MANURE AS MADE ON THE FARM.

The composition of farmyard manure made on different farms differs less than might be expected. So much of it is litter, and so little does the indigestible material of the solid fæces vary, that the only notable cause of variation is the urine. The results of some of the most complete analyses are given in Table I.

Both at Rothamsted and at Cambridge experiments have been made with beasts receiving cake and beasts receiving no cake, and the analytical results show how great a difference is produced. Cake raises the percentage of nitrogen from 0.32 to 0.57 at Cambridge, and from 0.51 to 0.77 at Rothamsted; it causes similar increases in the phosphate, but not in the potash. It has, however, an even more marked effect on the ammoniacal nitrogen, raising this from 0.03 to 0.20, and from 0.04 to 0.18 per cent. in the respective investigations. Allowing for these differences, however, the analyses all belong to a certain type, which can be called the bullock dung type.

Cow dung comes out quite differently. It contains less nitrogen, less phosphate, and also less potash.

Two causes seem to operate; some of the nitrogen and phosphate go into the milk, and therefore cannot appear in the excretions; and some of the nitrogen and potash go into the urine, much of which often gets down the drains. The result is that the dairy cow type of manure is distinctly poorer than that of the bullock type.

Lastly we come to horse dung. Its composition is usually intermediate between dairy and bullock dung; it contains no more ammonia than dairy dung because the urine is generally lost, but it contains as much phosphate and potash as bullock dung, as the diet is usually rich.

A comparison of these three kinds of dung is given in the following summary Table :—

	Total nitrogen	Ammoniacal nitrogen	Amide nitrogen	More complex nitrogen compounds	Phosphoric acid (P_2O_5)	Potash (K O)
Bullock	0 62	0 12	0 05	0 12	0 26	0 72
Cow	0 43	0 09	0 03	0 29	0 19	0 14
Horse	0 54	0 08	0 04	0 31	0 23	0 54

So much, then, for the composition of the manure. We now have to turn to the losses which it undergoes on storage, which, as we have seen, determine very much its composition and value to the farmer.

THE LOSSES DURING STORAGE OF FARMYARD MANURE.

It is generally recognised by good farmers that a manure heap should be made as compact as possible, and this rule is very generally practised. No further precaution is considered necessary, no attempt at providing shelter is usually made, and no particular notice is taken when pools of black liquid flowing from the heap show that the rainwater is actually washing through.

In order to obtain information as to the effect of these factors on the composition of the manure we have made a number of experiments with actual manure heaps stored in different ways. These we shall now proceed to discuss.

1. *Effect of Compacting.*—The first experiment was made with cow manure containing a considerable amount of faecal matter and 81 per cent. of water, and therefore readily capable of being plastered down into a compact mass. This was put up into heaps in January, 1911, and left till the following March, a period of three months—on the whole cold months. The temperature rose higher in the loose than in the compact heap, indicating a more vigorous fermentation, and this also was shown by the loss of dry matter. The highest temperature recorded in the compact heap was only 9° C., while in the loose heap it was 16° C.; the loss of dry matter was only 4 per cent. in the compact heap as against 7 per cent. in the loose one. These losses are very small. The loss of nitrogen was rather

higher, but not serious. In the loose heap it amounted to 7.5 per cent., all of which was ammonia; in the compact heap it was *nil*. Again the losses are only small, and all that can be said is that they are less from the compact than from the loose heap.

Another experiment was made with bullock dung containing less faecal matter and more straw than the cow manure, and only 75.4 per cent. of water, and therefore not capable of being so well plastered down. The heap was compacted as well as possible, but in the presence of so much straw this could not be done anything like so well as before. The heaps were kept from January 7th till April 14th, 1915, *i.e.*, a period of three months. There was a considerably greater rise of temperature and a greater loss of dry matter than in the cow manure heaps, and both were greater in the loose than in the compact heap. The temperature rose to 71° C. and 51° C. in the loose and compact heaps respectively, while the losses of dry matter were 35 and 30 per cent. The losses of nitrogen were considerably more than in the cow manure, not only did the ammonia suffer but also the more complex nitrogen compounds. The loose heap lost no more total nitrogen than the compact heap, but it lost more ammonia, which, of course, lowers its value. Again, therefore, the compact heap has come out best because there is less loss of ammonia. Compacting, however, has not really made much difference, and it might be difficult to justify if the results were no better than this in general practice. These experiments had been made in the winter months. Another experiment was accordingly made in warmer weather. The heaps of cow manure after being sampled for analysis in March, 1914, were put up again, the compact heap being once more compacted, and the loose heap once more left loose. This time, as a result of warmer external conditions, the results were very different. The temperature of the loose heap rose to 32° C., that of the compact heap to 22.5° C. only; the loss of dry matter from the loose heap was 26 per cent. and its nitrogen loss 30 per cent.; from the compact heap the losses were only 9 per cent. of dry matter and 14 per cent. of nitrogen. The benefit of compacting does not last indefinitely, however. If the manure is kept too long the speed of decomposition in the compact heap catches up that in the loose heap, and finally may even pass it. This happened in the heaps of bullock dung stored for nine months; as before there was more loss of ammonia from the loose heap, but in this case there was less total loss of nitrogen; compacting, therefore, has not been specially helpful. This result is of less practical significance than the other, because manure heaps are not usually kept for so long. These various experiments are summarised in Fig. 1. The data are as follows:—

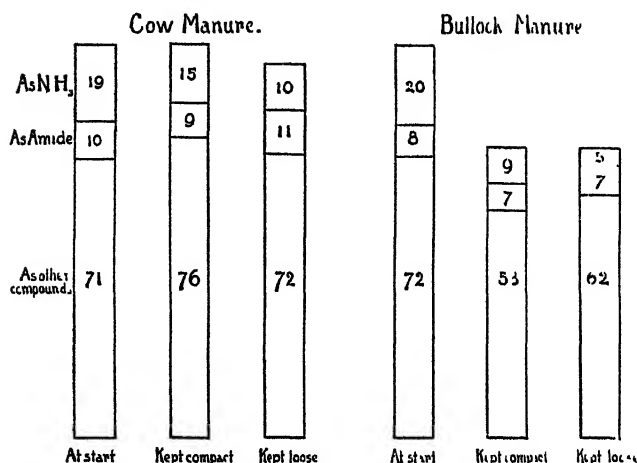


FIG. 1.—Losses of nitrogen from manure heaps stored for 3 months under cover. The results are given as ammonia (NH₃), as amide, and as "other compounds." The ammonia is the most valuable of all these.

Heaps	Cow manure 3 months		The same remade and then left another 3 months		Bullock manure 3 months		The same undisturbed for 9 months	
	Compact	Loose	Compact	Loose	Compact	Loose	Compact	Loose
Highest Temperature, °C.	9	16	22.5	32	51	71	51	71
Loss of dry matter, per cent	4	7.5	9	26	30	35	47.5	45
Loss of nitrogen, per cent	Nil	7.5	14	30	26	26	43	32
Of which—								
Ammonia	4	8.5	9.5	8.5	17	16	15	19
Amide	Nil	Nil	+0.5	+2.5	1	Nil	3	1
Other compounds ¹	+4.5	+1	5	23.5	11	10	21	12

¹ Nitrates were absent.

² G.m.

The results show that in a spell of warm weather a loose heap may suffer more than a compact one, although in cold weather there is less to choose between them. The practical conclusion seems to be that compacting should always be adopted as a measure of precaution. The trouble is not very great, and probably the saving more than repays it.

2. *Effect of Shelter.*—The heaps just discussed had all been kept under cover in a lean-to shed, so as to eliminate the effect of weather. Another set of heaps was put up, but kept out of doors exposed on all sides to wind, rain, and sun, to see what effect these had. Before long the outer layer had matted

together to form something of a thatch, but rain readily entered, and the usual black liquor soon began to flow away. The temperature did not rise so high as in the sheltered heaps, but the loss of dry matter was considerably greater. The loss of nitrogen was also higher, though there was not much difference in the case of bullock dung stored for three months. The results are plotted in Fig. 2. The data are as follows:—

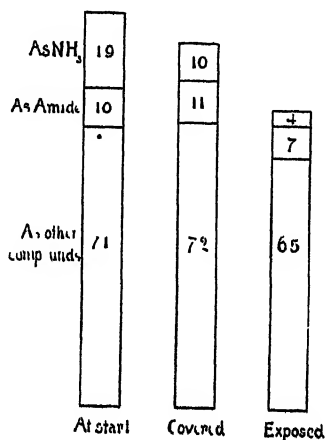


FIG. 2.—Losses of nitrogen from cow manure stored loosely. The results are given as ammonia (NH_3), as amide, and as "other compounds," the ammonia being the most valuable.

Cow Manure stored loosely.

	3 months' storage	
	Exposed	Covered
Highest temperature, °C	21	16
Loss of dry matter, per cent	21	7
Loss of nitrogen, per cent	25	7.5
Of which —		
Ammonia ¹	15	8.5
Amide	3	Nil
Other compounds ²	6	+1 ³

¹ For the non-technical reader it may be explained that ammonia (NH_3) is the most readily available nitrogenous compound in farmyard manure, and therefore a loss of ammonia is more serious than a loss of other nitrogen compounds. The 'amides' probably change quickly to ammonia in the soil. The 'other compounds' may or may not; they are more complex. In some of the German experiments it is recorded that ammonia sometimes changes to these complex compounds in the heap, but we have obtained no evidence of this in cow or bullock manure, although there was a gain in horse manure.

² Nitrates were absent.

³ Gain.

Bullock Manure.

	Compact 3 months		Compact 9 months		Loose 7 months		Loose 9 months	
	Exposed	Covered	Exposed	Covered	Exposed	Covered	Exposed	Covered
Highest Temperature, °C	40	51	40	51	55	71	55	71
Loss of dry matter, per cent	39	30	60	47.5	41	35	60	45
Loss of nitrogen, per cent	28	26	50	42	27	28	51	32
Of which—								
Ammonia	16	11	17	15	18	16	17	19
Amide	Nil	1	3	3	Nil	Nil	4	Nil
Other compounds ¹	12	14	30	24	11	10	30	13

¹ Nitrates were absent

Thus, weather is seen to have a very bad effect on manure, causing considerable loss. In view of the importance of this result a further experiment was made to see how much shelter is necessary, whether a permanent roof is needed, or whether something less will suffice. Two heaps were therefore put up on the Home Farm at Pyrford Court, Woking; one was covered with hurdles thatched with straw so arranged as to make a roof, the other was left in the usual way. The heaps were left from May 27, 1915, to October 19, 1915, a period of four and a half months. The following losses occurred:—

Losses from compacted heaps stored in the open.

MIXED MANURE, WOKING, MAY 27, 1915, TO OCTOBER 19, 1915

	Covered with thatched hurdles	Not covered
Loss of dry matter, per cent	35.5	33.5
Loss of nitrogen, per cent.	36.5	39
Of which—		
Ammonia	10	12
Amide	3.5	1
Other compounds ¹	23	23

¹ Nitrates were absent

Little difference is apparent, but, as we shall see later, the difference is greater than it looks, and the shelter has proved useful.

A further experiment was made at Rothamsted to see the effect of the layer of earth. Two heaps of cow manure were put up on November 29, 1915; both were compacted and left in the open; one was covered with a layer of six inches of soil, while the other was left uncovered. The heaps were analysed on May 15, 1916, and the following losses were found:—

Losses from compact heaps stored in the open and under cover.

COW MANURE, ROTHAMSTON, NOVEMBER 29, 1915, TO MAY 15, 1916.

	Under cover	Covered with 6 in soil	Not covered
Highest temperature, °C . . .	8	—	—
Loss of dry matter, per cent . .	15	21	11
Loss of nitrogen, per cent . . .	28	32	26
Of which—			
Ammonia	23	21	21
Amide	Nil	2.5	2.5
Other compounds ¹	5	8.5	2.5

¹ Nitrates were absent

In all three heaps practically all the ammonia has gone, and chemical analysis shows no benefit from the covering of earth; indeed, so far as the dry matter is concerned, it seems actually harmful. The crop trials, however, tell a different story, as will be shown later on.

In all these cases we have estimated the losses only by chemical analysis; but in dealing with manurial problems, and especially so complex a set of problems as those presented by farmyard manure, it is not sufficient to rely on chemical analyses, and field experiments have to be made in addition. The results of these are set out in Table II. In every case the heaps stored under cover have given the best results. Where potatoes were grown the value of the increase was considerable even in 1916, the season of bad yields; it was as follows:—

	Increase per acre due to storing manure under cover	Value of increase per acre
		£ s d.
1915 Potatoes	(a) Stored loose: 16 cwt	2 16 0
	(b) Stored compact: 1 ton 12 cwt	5 12 0
1916 Potatoes	7 cwt	4 0 0
Wheat	2 bushels	—

TABLE II.—*Crop yields obtained from dung stored in different ways*

YIELD OF POTATOES MANURED WITH BULLOCK DUNG, 10 TONS OF STORED MANURE PER ACRE, ROTHAMSTON, 1915

	No manure	Loose heap under cover	Compact heap under cover	Loose heap in the open	Compact heap in the open
Weight of potatoes, tons per acre	5.11	6.52	9	8.02	7.88
Percentage increase over the unmanured plots	—	73	76	57	44
Weight of original dung, tons per acre	—	15.52	12.96	13.68	12.05

YIELD OF WHEAT MANURED WITH MIXED DUNG STORED UNDER COVER
AND IN THE OPEN, 10 TONS OF ORIGINAL MANURE PER ACRE.
WOKING, 1916.

	No manure	Compact heap in the open	Compact heap under cover
Weight of grain per acre . lb	1,268	1,552	1,676
Weight of straw per acre . "	2,012	2,201	2,380
Total produce per acre . "	3,280	3,756	1,056
Bushels of grain per acre . "	20 4	25 0	27 0

YIELD OF POTATOES MANURED WITH COW DUNG, 20 TONS OF ORIGINAL
MANURE PER ACRE ROTHAMSTED, 1916.

	No manure	Compact heap under cover	Compact heap in the open	Compact heap in the open covered with soil
Weight of Potatoes, tons per acre	2.63	4	3.65	3.91
Percentage increase over un- manured plots	—	52	39	48
Weight of stored manure applied in tons per acre	—	16.06	15.89	11.32+1.02 of soil

YIELD OF RIVETT WHEAT MANURED WITH BULLOCK DUNG, 10 TONS OF
STORED MANURE PER ACRE. ROTHAMSTED, 1916.

	No manure	Loose heap under cover	Compact heap under cover	Loose heap in the open	Compact heap in the open
Weight of grain per acre . lb	1,933	2,129	2,262	2,115	1,981
Weight of straw per acre . "	3,010	3,520	3,530	3,070	3,380
Total produce per acre . "	1,913	5,649	5,792	5,185	5,361
Bushels of grain per acre .	33 2	36.7	38 9	35.8	33 7

The first experiments recorded in the Table, the Rothamsted potato experiments of 1915, show that equal weights of the loose and compact heaps stored under cover gave approximately equal returns, but when account is taken of the amount of original dung wanted to make the ten tons of the stored manure, then the advantage lies with the compact heap. With heaps stored in the open the result was reversed, the compact not coming out so well as the loose. But between the sheltered and the exposed manure there is a very great difference, thus emphasising the necessity for shelter.

The Woking experiment is interesting, because the cover was made of thatched hurdles only. The difference recorded was less than was indicated by the appearance of the crop, for, that grown on the covered manure started much better than

the other. By an accident, however, a furrow came into this plot and not into the other, so that it stands at a disadvantage in the weighings; in spite of this it comes out the better.

The soil covering of the 1916 heap at Rothamsted has also proved a distinct help, though the manure did not come up to the sheltered heaps in value.

The field experiments are of further interest because they show that the conclusions drawn from chemical analyses of the heaps are in the main correct. The Woking experiment, however, cautions us that we cannot rely exclusively on analysis because the plant found some superiority in the sheltered manure that analysis failed to detect. But in the main the loss of nitrogen, weighted to give proper value to the ammonia, and combined with the loss of dry matter, gives a very fair indication of the change in manurial value.

The practical conclusion can be drawn that the provision of shelter for the heap is very important, and that serious losses arise when manure is exposed to the weather. Compacting the heap does not do away with the losses; indeed, in some cases, it only slightly diminishes them. The only way of dealing with them is to provide a shelter of some sort, or failing that, a layer of earth.

3. *Does sheltered manure spoil by becoming too dry?—*

An objection often raised by practical farmers to the storage of manure under cover is that it tends to become dry and to suffer loss. An experiment was made by us at Woking to discover what changes take place under these conditions. A heap of mixed farmyard manure was put up in a shed and left from November 1, 1913, to May 20, 1914; a second heap of the same material was left in the open. The moisture content of the sheltered heap fell from 76·8 to 72·6 per cent., that of the exposed heap from 76·5 to 72·0. The losses were as follows:—

	Stored in shed	Stored in open
Loss of dry matter, per cent.	26·5	30·5
Loss of nitrogen, per cent.	8	33·5
Of which —		
Ammonia	12·5	18·5
Amide	Nil	7
Other compounds	4·5	9·5
Gain in nitrate ¹	9	2

¹ These are the first heaps in which nitrite was measurable; in the other cases it could only be detected by delicate tests

The heap in the shed was protected from wind and rain and lost only 8 per cent. of its nitrogen, while the corresponding heap in the open lost no less than 33 per cent. The

ammonia in both cases suffered considerable loss, but whereas in the sheltered heap it reappeared as nitrate, in the exposed heap there was practically no nitrate present. Sufficient was found, however, to indicate that nitrate was also formed in the exposed heap, but did not accumulate.

This formation of nitrate in the sheltered heap in such large quantities is very striking. The nitrate was only present in the dry outer portion of the heap; none could be detected in the black material lower down. Further experiments showed that the nitrate persisted so long as the manure remains dry, but as soon as the rain comes it is washed inside the heap, where it rapidly decomposes. Nitrate formation is desirable in the soil, but not in the heap because of this risk of loss. Thus there is some foundation for the popular dislike of a dry manure heap.

A still further reason against dryness is that the straw cannot decompose, and until this has taken place the full value of the manure cannot be obtained.

Some farmers have endeavoured to cope with the difficulty by pumping liquid manure on to the heap, or, in the case of manure from the horse stables, simply watering it to facilitate rotting. In order to try the effect of this, one of the heaps of cow manure left loose under cover was periodically watered from a can, sufficient water being added to keep the heap perpetually moist, without, however, leaving an excess to drain away. The results are as follows:—

	Watered heap	Heap not watered
Loss of dry matter, per cent.	5	7.5
Loss of nitrogen, per cent	13.5	7.5
Of which—		
Ammonia	7.5	8.5
Complex compounds	6	+ 1 ¹

¹ Gain.

It is clearly a disadvantage to water the heap, as thereby the loss of nitrogen is increased; the only exception is when the liquid is pumped in immediately before the manure is applied, so that there is no time for any decomposition to occur. Our general conclusion is that dryness is not particularly good for the heap; it tends to encourage nitrate formation which is not specially desirable and to discourage the decomposition of the straw which is eminently desirable. But to try and remedy matters by adding water only makes things worse; the loss of nitrogen may become very marked, and direct field experiments show that the exposed manure always gives less crop than the sheltered manure. The best

course is to shelter the heap, but to check the tendency to dryness by keeping it as compact as possible.

4. *Moving the heap.*—None of our experiments deal directly with this point, but we learn something about it from one in which the heaps, after being put up and left for three months, were turned and made up again.

In the heap that had been sheltered all the time the loss of dry matter during the first period had been 7 per cent. and the highest temperature attained was 16° C. For some time the temperature had been stationary, indicating a cessation of decomposition. Directly the heap was moved, however, the temperature began to rise, as shown in Fig. 3, and the

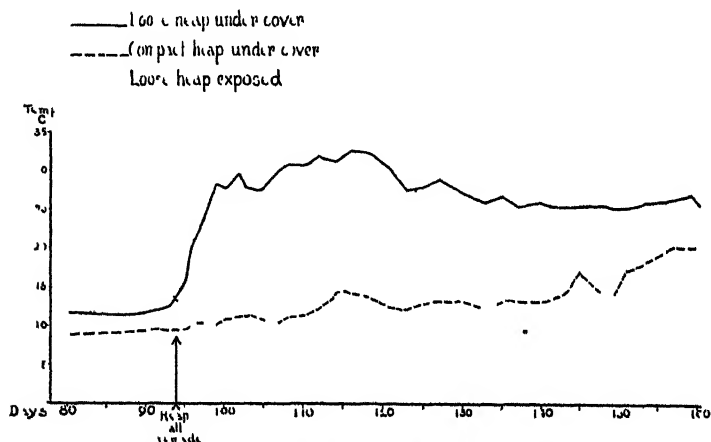


FIG. 3.—Temperature charts for manure heaps before and after remaking.

decompositions were put in train once more; the temperature rose to 32°, and the loss of dry matter rose a further 26 per cent., making a total loss since the beginning of 32 per cent.; the loss of nitrogen rose a further 30 per cent. to a total of 35 per cent. The exposed heap had undergone considerable changes in the first period and therefore had not so far to go, but it behaved in the same way. Its temperature rose after turning and further losses set in, which, however, were on a smaller scale than those of the sheltered heap. In the end the two heaps came out almost exactly alike, and the whole advantage of sheltering the heap was completely lost by turning it.

The experiment shows that moving the heap sets the decompositions going again and therefore results in much loss. And yet in the old days it was a common practice;

indeed, the old farmers regularly made a distinction between a "drawn-up" mixen compacted by carts, and a "thrown-up" mixen left loose. This practice was investigated by the late Dr. Augustus Voelcker,¹ who showed that it led to much loss of ammonia and to no particular gain, so that it has now gone out of use except by horticulturists; it is only justified where the manure is wanted for top dressings or for late application.

The results were:—

	Sheltered heap			Exposed heap		
	First 3 months	Turned, then left another 3 months		First 3 months	Turned, then left another 3 months	
	16°	32°		21°	29°	
Highest temperature, °C						
Loss of dry matter, per cent	7	Further loss 26	Total loss 32	21	Further loss 16.5	Total loss 34
Loss of nitrogen, per cent.	7.5	30	35	25	13	35
Of which—						
Ammonia	8.5	8.5	16	15	3	17
Amide	Nil	+2 ¹	+2 ¹	1	+2 ¹	+1 ¹
Other compounds	+1 ¹	23.5	21	9	12	21

¹ Gain

Summer Storage.—Some of our experimental heaps have been allowed to stand over the summer and have thus thrown light on the very important question of summer storage. Our general conclusion is that none of the methods can be relied upon to prevent loss in summer. Compacting works satisfactorily in winter, and in the early days of warm weather, because it delays the setting in of the decomposition processes; but it does not protect against them, and once they start in summer they go on as far in the compact heap as in the loose heap. This is shown in the table on page 12, where the bullock dung stored for nine months lost just as much whether it was compacted or left loose. Nor is shelter altogether a safe protection.

The fact seems to be that a manure fairly easily undergoes a certain amount of decomposition, losing about 30 per cent. of its nitrogen. This loss can be retarded by sheltering and by compacting, but it cannot be prevented. So long as the weather is cold and the heap is not kept too long the retardation may be sufficient to preserve the heap against notable loss. But when the weather becomes warm decomposition goes on,

¹ This Journal, 1856, Vol 17, page 191. This was the first important British investigation on the subject.

and if it is given time enough it will proceed to its limit whether the heap is compacted, turned, sheltered, or exposed.

We may summarise the conclusions from these various analyses and field experiments with manure as follows :—

Manure keeps best when it is—

- Kept thoroughly compact ;
- Sufficiently moist, but not too wet ;
- Under shelter ;
- Not moved.

But none of these do more than retard the inevitable loss.

Can we get a stage further and stop it altogether ?

These manure heap experiments tell us what losses arose in the heaps, but they do not tell us why they arose. Before we can effect improvement on the result we must first know exactly how the losses are brought about, and why they are happening. Then only shall we be in a position to know how to obviate them. It does not follow that we shall be able to suggest a profitable way of doing it, but all experience shows that once the necessary conditions are discovered it does not take long for some ingenious person to find a cheap way of satisfying them.

The experiments designed to find out what is going on in the heap, and why the loss arose, had perforce to be made in the laboratory. The laws of nature hold good everywhere, and any reason discovered in the laboratory holds good in the field also. Field work has the advantage that all the factors are at work, and are therefore discernible, while laboratory work has the advantage that the factors can be dealt with one at a time, and their action studied in some detail.

THE DECOMPOSITION OF MANURE UNDER CAREFULLY CONTROLLED LABORATORY CONDITIONS.

It is not necessary for our present purpose to go into the details of the laboratory experiments. These will be discussed in the *Journal of Agricultural Science*. We must, however, give the main outlines of the experiments and their results before we can proceed with our argument.

The first point to be tested in the laboratory was the effect of compacting the heap. We have seen (Fig. 1) that a heap of cow dung which could be plastered down suffered practically no loss when it was sufficiently compacted, while a heap of bullock dung containing more straw and less faecal matter, which could not be so well plastered down, suffered considerable loss even when it was compacted. The result indicates that the loss is due to the penetration of air, and laboratory experiments were accordingly instituted to test this view.

Two series of experiments were made.

1. *Manure kept without air.*—A quantity of farmyard manure was packed tightly into large bottles which were then completely closed so that no air could enter. The temperature of one was kept at about 6° C., and of the other at 26° C. After 50 days the bottles were opened, and the manure analysed. The results were as follows :—

	about 6° C.	26° C.
Loss of dry matter, per cent	2	7
Loss of nitrogen, per cent.	5	3
Gain of ammonia	1.5	15
Loss of amide	+1 ¹	1
Loss of other compounds	7.5	17

These figures are plotted in Fig 4.

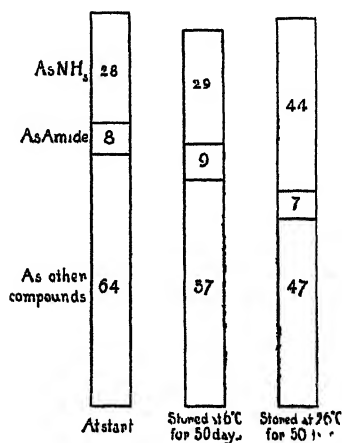


FIG. 4.—Changes in nitrogen compounds when manure is stored with perfect exclusion of air. Not only is there no loss, but there is a gain in value because of the increase in amount of ammonia (NH₃).

Thus it appears that storage without *any access of air* causes only little loss of nitrogen; indeed, with absolute exclusion there is probably none at all. A new result comes out here, however, when the manure is stored at a high temperature. There is a great production of ammonia, and consequently the manure gains distinctly in value. This is the first time such a result has been obtained, all the heaps stored in the previous experiments having suffered losses. This gain occurs only when the heap is stored at a sufficiently high temperature and out of contact of air.

2. *Manure kept with access of air.*—In these experiments air was passed through the bottle, and arrangements were made to catch any ammonia carried over. The experiment was continued for 70 days. There was no great stream of air, but a

gentle drift. At the conclusion of the experiment the manure was analysed with the following results:—

	Temperature of storage	
	15° C.	26° C.
Loss of dry matter, per cent.	3	5
Loss of nitrogen, per cent.	28	30
Of which—		
Ammonia	21	28
Other compounds	18	4
Nitrate formed	11	2

The experiment was repeated with results set out in Fig. 5.

Thus, here there has been a loss of nitrogen, just as with the heaps. The experiment shows, therefore, that the introduction of air causes a loss, and the analysis tells us something about it. The loss is not due to any solid or liquid compound, for all these are kept in the bottle; nor is it due to ammonia, for this

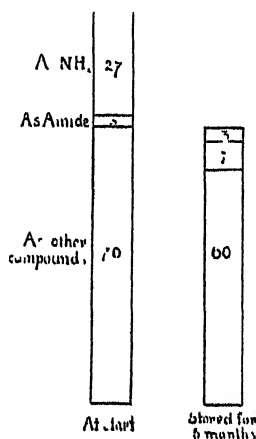


FIG. 5. Changes in nitrogen compounds when manure is stored with access of air. There is a considerable loss of ammonia (NH₃) and of other compounds.

is completely caught in the acid traps. The only adequate explanation is that it is caused by an evolution of nitrogen. We conclude then that the penetration of air into manure leads to an evolution of gaseous nitrogen quite apart from any losses of ammonia or other constituents that might occur.

The conclusion is remarkable, because, as every chemist knows, nitrogen is not a particularly easy gas to split off from its compounds.

The further series of experiments made to discover the cause of the loss are of chemical rather than of agricultural interest, and need therefore only a brief reference.

Separate experiments were made with urine, fæces, and litter, to see which of these was responsible for the action.

These experiments gave a wholly unexpected result. When we had dealt with the manure as a whole we obtained losses of nitrogen as shown on page 23, but when we came to the separate constituents there was no loss whatsoever, the whole of the original nitrogen being recovered.

Even when the constituents were mixed there was no loss. The following are typical results:—

	Liquid urine alone	Urine on glass wool	Urine on straw	Urine + faeces + straw		
Nitrogen at start	0.0179	0.0179	0.0246	0.0216	0.0331	0.0315
Nitrogen at end	0.0175	0.0178	0.0253	0.0243	0.0332	0.0313
Loss of nitrogen	0.0001	0.0001	+0.0007	0.0003	+0.0001	0.0002
" " per cent.	Nil	Nil	+3.1	1.3	Nil	Nil
Nitrate formed	17	Nil	Nil	Nil	Nil	Nil

Now that result was not in the least expected. Further investigation was made, the details of which need not be recorded here, which showed that *farmyard manure suffers loss of nitrogen only when it has been partly exposed to air and partly cut off from air.*

The conclusions to which these laboratory experiments lead are as follows:—

1.—The loss of nitrogen from the manure heap is partly due to three causes—

- (a) The washing away of soluble substances;
- (b) The volatilisation of ammonia;
- (c) The liberation of some other gas, presumably gaseous nitrogen.

2.—These losses set in as soon as air is allowed to enter, and they become more intense as the temperature rises.

3.—The losses do not take place when air is rigidly excluded from the manure.

4.—By shutting off all access of air and allowing the temperature to rise there is not only no loss, but a distinct improvement, and a manure is obtained of very high quality.

5.—Both analyses and field experiments show that exposure to weather causes a falling off in quantity and quality which no amount of compacting will remedy.

6.—No heap that we have been able to make begins to fulfil these conditions. There has never been the improvement obtained in the laboratory experiments, but, on the contrary, always a loss—sometimes a considerable one.

MANURE HEAPS IN PRACTICE.

We must now, in the light of these results, examine some of the methods in use among practical men to see how

near they come to the ideal indicated by the laboratory experiments.

Here we must divide the subject into two parts, taking first the case of bullock dung where the manure is made in a yard but left there until the beasts are all sent out ; and second, the case of dairy cattle where the manure has to be cleared out daily.

Bullock Manure.—Making and storing are in this case so closely allied that we shall not attempt to distinguish them. We begin with the usual method of making dung in an open yard. This offends two of the most important canons. The manure is open to access of air, and, above all, it is open to weather. This method is ideal for the particular loss described on page 18, in which nitrate forms on the outside of the heap wherever there is any drying, and then washes inside to be decomposed.

Further there is often serious loss by leaching, which is intensified when, as is not uncommon, the gutters and spouts of adjacent roofs are out of order and discharge volumes of water on to the manure in wet weather. The loss is difficult to estimate because it is very variable, but there can be no doubt that it is very considerable. We cannot find any counterbalancing advantage about this method, and we must therefore condemn it. We have gone into the question very carefully and cannot find that rain ever does any good to manure ; on the other hand, it often does much harm.

A better method is to put a roof over the covered yard. It is not necessary to join the boards on the roof ; indeed, it is an advantage not to do so because the animals get better ventilation when the roof boards are spaced. In our own yard we find an interval of about half an inch between the boards is satisfactory ; practically no rain gets through this, and there is ample ventilation.

The effect is at once seen in the drier state of the manure ; nothing is washed away. If there are enough beasts to make the whole mass compact it does not become too dry, and owing to the reduction of loss there is at the end of the season considerably more manure than in an open yard. Both in quality and in quantity, therefore, this method gives improved results, and is strongly to be recommended.

Where the covered yard does not exist or is not sufficiently large a good substitute can be made in the Dutch barn. The threshing should be arranged to clear a sufficient number of bays to accommodate all the beasts, and the straw stacks should be set in the rest of the barn, or just outside, so as to give shelter from wind and rain. Poles are then fixed up to keep the beasts off the surrounding straw or unthreshed corn, and mangers are put in. The surrounding straw makes highly

efficient walls, and the beasts live very comfortably. (Fig. 6). The manure is, of course, sheltered from the weather, and is as good in quality and as great in quantity as that made in a good covered yard. We have adopted this plan with considerable success on our own farm.

The best method of all is to make the manure in a stall or box where, in addition to the complete exclusion of the weather attained in the covered yard, the animals have less space in which to wander about, and therefore tread down the manure more efficiently.

The boxes at Woburn have been carefully tested, and the losses there amount to 15 per cent. only. A test made by one

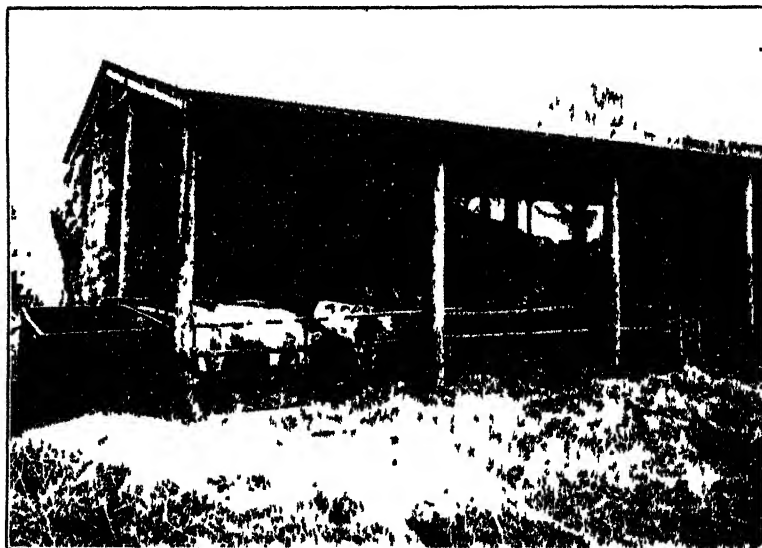


FIG. 6—An arrangement that works satisfactorily where the covered yard is not large enough to take all the beasts.

of us at Wye also gave a loss of 15 per cent. This loss arises in spite of the consolidation, and we know no way of reducing it. However, this is not very serious.

None of these methods, not even the box or stall, come out as well as the laboratory method because there is always a loss of nitrogen, which is at least 15 per cent. and in most cases very much more. And in none of them has there been observed the improvement in quality noted in the laboratory where, in absence of air and under sufficiently warm temperature, the ammonia increased in amount. The box is not

practicable on a large scale, but the covered yard or the Dutch barn is, and we hope it will become more common.

HAULING OUT THE MANURE.

Having thus made the manure, the next point is the method of dealing further with it. There are three possibilities: the manure heap may be—

1.—Drawn out and worked straight into the land, *i.e.* early application;

2.—Drawn out and clamped till wanted, *i.e.* late application;

3.—Left in the yard till wanted, *i.e.* late application.

The choice between these three depends very much on local conditions. Fortunately the problem has been studied in several districts, and a brief summary of the results may therefore be given.

1.—In the south of England, the Midlands, and in Yorkshire the best results are obtained by applying the manure to the land in the winter immediately it is drawn out from the yards, and then ploughing it in as soon as possible. Besides giving the best crop results this method saves the labour of making a clamp, and also it saves time in the spring—a very great consideration to most farmers. The details of the experiments are as follows.

Shropshire.—The experiments were made at the Harper Adams Agricultural College¹, and are recorded in their Reports for 1911 and 1913. Farmyard manure was applied to one plot in January, to the other at the time of ridging. The late manured potatoes started earlier, and looked better throughout May and June, but they fell behind in July and August. The final results were:—

	1911	1913. Total crop, tons per acre			
	Lb per rod	Culdees Castle	Croftier	Great Scot	
		T. c	T. c.	T. c.	T. c.
Winter application	82½	11 3	10 13½	13 4½	
Spring application	74	10 12½	10 3	12 3½	
Balance in favour of winter application	8½	0 10½	0 10½	1 1	
Estimated value of ware	—	28s.	16s.	36s. 6d	

*Cheshire*².—These are the most extensive experiments of the series, for they lasted over four seasons, and were made on

¹ *Harper Adams Reports*, 1911, page 85, and 1913, page 23.

² *Holmes Chapel Agric. Coll. Rept.*, 1909, page 36.

soils varying from loam to clay. The following is a summary of the results :—

	Potatoes	Swedes	Mangolds
Dung applied in December	5 7	11 5	22 1 tons per acre
Dung applied in April	5 5	12 8	17 7 " " "
Advantage of winter dressing	—	1 7	4 4 " " "

Yorkshire.¹—The experiments were made on hay land. Ten tons per acre of fresh manure were applied to hay land in January, 1900, while an equal amount was clamped and left to rot till the following March, when it was applied. It then weighed 8 tons 1½ cwt. The yields of hay in cwt. per acre were :—

	Experiment 1 Beasts fed with decorticated meal		Experiment 2 Beasts fed with under- corticated cotton cake	
	Fresh manure	Rotted manure	Fresh manure	Rotted manure
Average of 3 plots for 1900	Cwt 45	Cwt 37 5	Cwt 44	Cwt 38 0
Average of 3 plots for each of next 4 years, 1901-4	46	41 5	46 5	13 7
Total increase over 5 years from applying manure fresh instead of rotted	25 5	—	17	—

2.—In the North of England (Durham) and the South-west of Scotland (Glasgow) the best results were obtained by clamping the manure and applying it in the spring. This does not, of course, prove that clamping is beneficial, but simply that the spring is a better time for application than winter.

Cockle Park.—Several experiments have been made here. In 1898 Somerville² found that spring manuring gave the best results for swedes and turnips, the yields per acre being :—

	Dung alone		Dung and artificials	
	T	c	T	c
Winter application	17	13½	22	17½
Spring application	20	17	23	15
Advantage in favour of spring application	3	3½	0	18½

A similar result was obtained by Gilchrist in 1906-7.³

¹ *Leeds Farm Guide* for 1906, page 7, and for 1912, page 10. In the springs of 1901-2-3-4 all the plots had received 1½ cwt per acre of nitrate of soda.

² *Agricultural Experiments*. "Five years' work at the Northumberland County Demonstration Farm" W. Somerville, 1902, page 19.

³ *Cockle Pk. Bull.* No. 10 (*Guide to Cockle Pk. for 1907*) pp. 51-55.

Experiments made with swedes :—

10 tons of dung applied in December, 1906, gave	15½ tons.
10 tons of the same dung clamped till June 7, 1907 (the time of sowing) and then applied, gave	19 "
Advantage in favour of spring dressing	3½ "
10 tons of fresh dung applied on June 7 (which, however, would not necessarily be of the same composition as the above) gave	18 "

The experiment was also repeated by Gilchrist at a centre in Durham with practically the same result. No details were published. On the other hand a different result was obtained with mangolds by Somerville¹ in 1900 :—

	7	6
Winter application	28	17
Spring application	26	17
Advantage in favour of winter application	2	0

It would be interesting to repeat this experiment, and ascertain why the result differs from that of the swedes.

*Glasgow Experiments.*²—Berry found in the west of Scotland that spring dressings on potatoes and turnips gave 50 to 60 per cent. increases, while autumn dressings only gave 25 per cent. increases over the control plots.

	Potatoes			Turnips		
	Increase over unmanured plot			Increase over unmanured plots		
	Weight per acre	Money value per acre	Per cent	Weight per acre	Money value per acre	Per cent
	T c	£ s d		T c	£ s d	
Spring application	4 2	9 3 2	157	6 2	2 8 6	141
Autumn application	2 1	4 12 0	126	3 11	1 9 6	125

In those cases where early applications do not give good results the further question arises whether the manure is better left in the yard till it is actually wanted, or carted and made into a clamp. We know of only one experiment and this was made at Peepy, Northumberland.³ Some of the manure was made into a heap in the field, and left during the winter. The rest was kept in the fold-yard till the time of sowing the swedes. The results came out practically the same : it was found that 12 tons of the manure stored in the field was within the error

¹ "Five Years Work, &c.," page 26

² *West of Scotland Agric. Coll. Bull.* No 65, 1914.

³ *Armstrong College Bulletin* No. 10, 1914.

of the experiment just about as effective as 12 tons drawn straight from the fold-yard. The yields per acre were :—

	Swedes 1910	Subsequent crops				
		Barley, 1911		Hay, 1912	Oats 1913	
		Grain bushels	Straw, cwt	Owl	Grain, bushels	Straw, cwt
Manure drawn straight from yard (Plot 20)	20½	32½	22½	27½	58½	24
Manure stored in heap in field (Plot 19) (Applied to swedes in both cases)	18½	31	23	31½	57½	21½

The result must depend to a considerable extent on the amount of exposure in the fold-yard and in the field respectively. Under otherwise equal conditions one would expect the moving of the manure involved in making the heap would be a disadvantage, because it sets in train the various decompositions as already pointed out (page 19). On farms where a fair acreage is under roots the whole of the dung made during the winter and up to the end of May can be got out and used at once. But on dairy farms where most of the land is under grass, hay and grain crops, and only little under roots, it may not be possible to utilise all the dung, and some of it—up to one-half and even more—may have to be stored over the summer.

The experiments on page 12 show how great a loss may be brought about in this way. During the summer the decomposition processes are all at their maximum. They can be diminished by compacting the manure and keeping it under cover, but however well this is done some losses always remain. One of the many advantages of a large area of tillage land as opposed to grass is that it allows of full utilisation of all the farmyard manure produced.

The general conclusion is that the making of a heap should be avoided if possible. Over most of England the manure can be put straight out on to the land in winter, and where later application is better the manure is probably best left in the yard till it is wanted.

Against this, however, is the very important practical consideration that the horse labour has to be properly distributed so as to get in all the work comfortably, and it may be necessary to carry out manure before the land is ready for it, or when the land is too soft to allow of distribution. There is then no option but to make a heap. In that case the heap

should be covered by a layer of earth, by straw thatched hurdles, or in any other way that the ingenuity of the man on the spot can devise.

STORAGE OF FARMYARD MANURE—DAIRY MANURE.

On dairy farms the manure cannot be left under the beasts, but has to be removed daily or every other day. What is to be done here? The loss in making the heap is pretty considerable, because there is the daily moving effect. Maercker and Schneidewind¹ built daily heaps for 136 days (June 16 to October 29, 1896). Two heaps were made, one covered and one exposed. The loss of nitrogen was as follows:—

Manure left in deep box	.	13.2 per cent.
Moved daily to covered heap	.	36.9 „
„ „ exposed heap	.	37.4 „



FIG. 7.—The worst way of keeping farm manure. It is thrown out of a hole in the wall and exposed to wind and rain.

The loss entailed by moving the manure daily in warm weather is serious, and practically counteracted any beneficial effect that might have been anticipated from sheltering.

We now turn to methods actually adopted in practice to see how far they tend to aggravate or reduce the loss.

First, we take the method in use in some of the North Country dales in which the manure is thrown out from a hole in the wall, and left to lie in a heap until it can be removed. Fig. 7 shows an instance. It would be invidious to specify the particular dale, because this one is no worse than its neighbours. Of all ways of storing manure we have seen, this is the worst.

¹ *Landw. Jahrbücher*, 1898, 27, 215.

The heap is loose, exposed to heavy rainfall, no provision is made for catching any of the liquid—nothing, in short, is done to conserve the manure.

A much better method is in use in Oxfordshire. Immediately adjoining the cowshed and the stables is a manure house into which the manure is thrown both from cows and from horses. Thus there is no exposure to rain, and the sole loss arises from the penetration of air. If a few store bullocks or pigs can be kept in the house even this loss would be reduced, because the heap would be made more compact.

The stone manure house of Oxfordshire is now too costly for general use. A much cheaper, but still very efficient substitute is adopted in Cheshire. The one used at the Holmes

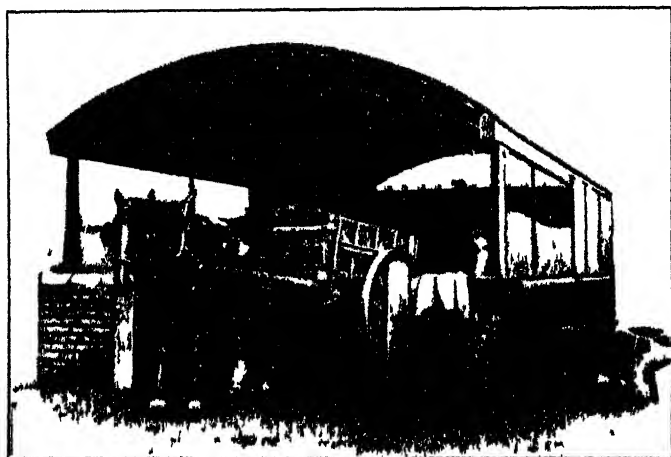


FIG. 8—A useful type of dungstead for dairy farms. Holmes Chapel Agricultural College.

Chapel Agricultural College is shown in Fig. 8. A space, sufficient, but not too large, is surrounded by a wall about 4 ft. high, leaving a way in for the cart; a roof of corrugated iron is then built on. The floor is cemented and slopes towards the back, where a tank is made to hold any liquid that drains away. Sides and back are fixed to protect against the prevailing wind. The cost of this is not great, and it is soon repaid. This form of dungstead can be recommended for general use, and is already being adopted in Scotland.

Again, however, the provision of shelter does not completely settle the matter. It is still necessary to keep the manure compact and moist. This can be done by running the cart over it, or by straightening out the heap and keeping some store

bullocks or pigs upon it. There is considerable scope for experiment for ingenious minded young agriculturists.

Some farmers have objected to a roof on the grounds that the manure becomes too dry on the top, and therefore suffers loss. As already pointed out the remedy of allowing rain on to the heap is worse than the disease. In all cases special care must be taken of the liquid draining away from the manure. In a good dungstead a tank is made to hold it, and a pump is erected to facilitate distribution. The liquid should not be pumped on to the manure (page 17) except just before spreading; it must be applied separately to the land. The use of liquid manure is an old Flemish practice that came into this country in the eighteenth century. Recently Hendrick¹ has published some experiments showing what good results can be obtained by this method. His analyses of the liquid show that it has the following composition:—

1,000 gallons (4½ tons) contains :
 20½ lb. Nitrogen equivalent to 100 lb. Sulphate of Ammonia
 3 lb. Phosphoric Acid „ 25 lb. Superphosphate
 46 lb. Potash „ 3 cwt. Kainit.

It gave excellent results on grass land.

In order to get over the admittedly troublesome problem of distribution, Dr. Charles Douglas of Auchlochan fills his tanks with any absorbent material that can be got without too much cost or labour. Thus a wet solid is obtained, which can be spread from a dung cart. There still remains a surplus of unabsorbed liquid which can be put on the grass land.

The liquid from the dungstead, however, is by no means the most important part of the liquid manure. It frequently does not contain the urine, for this has not been absorbed in the cowshed, but has simply run into the drains. In some cases the drain leads to a tank from which the liquid can be pumped (unless, as sometimes happens, the tank leaks), but even then the liquid is very dilute, because the tank also receives the wash water from the byres. On many farms, however, no proper use is made of the liquid manure; it simply runs down the drain, doing no good to anyone, and sometimes much harm. Indeed on one dairy farm one of us has seen a small sewage plant erected to decompose it, while considerable annual expenditure was incurred in the purchase of stable manure from London!

We consider the most efficient method of dealing with this is the Belgian method—the direct descendant of one of the old Flemish methods of farming which so greatly attracted the attention of agricultural writers in the seventeenth, eighteenth,

¹ *Bulletin No. 19, North of Scotland Agric. Coll., 1915.*

and early nineteenth centuries. This has been described by Mr. H. Vendelmans in the pages of *Country Life* (June 10, 1916). The cowshed is built on a different principle from ours. The whole length of the part where the cattle are to stand is excavated, and the soil is thrown on to the passages before and behind the cattle, making a long pit $2\frac{1}{2}$ ft. to 3 ft. deep, and about 6 ft. wide, all down the length of the house. The bottom is made to slope towards one end, the floor is rammed carefully, and the whole is brick-lined and covered with cement, so as to make a watertight tank. A roof is then built level with the passage. This is made of re-inforced concrete, or of bricks strengthened with girders, and it slopes very slightly (one inch is sufficient) from front to back so as to allow a fall for the liquid. An iron grating, 6 in. by 6 in. is let in at the back so that the liquid readily drains away. Thus the liquid manure tank underlies the whole cowshed, and it is provided with a sloping floor so that the liquid all collects at one end. Here a hole about 2 ft. square is made outside the house, and about four inches deeper than the tank. This is cemented to make it watertight, and then connected with a tank by means of a hole in the wall, so that the liquid always runs into it. A pump is fixed up here, capable of delivering about 100 gallons per minute. It reaches the bottom of the outside hole so that it can completely remove all the liquid, it is also high enough to deliver straight into the liquid manure cart.¹

The use of this tank ensures the saving of liquid manure, and when it is combined with a shed for the conservation of the other manure, the arrangement is about as good as is possible on our present knowledge.

So far as we know no similar tank is in use in this country, though we hope to have one installed for experimental purposes.

We now turn to the final problem. Do our experiments suggest any better way of dealing with manure than has been used hitherto? We have seen that the present methods of storing manure are essentially wasteful; certain precautions may be taken in winter, spring and early summer to reduce the loss, but they are not wholly successful, and are apt to break down in the summer. They serve sufficiently where bullocks are fattened in stalls or covered yards, but they are not entirely effective for dairy purposes. For the present we recommend storing the liquid in a tank, and the manure in a covered dungshed, compacting the heap to reduce loss of moisture, *but not watering it*. Our experiments indicate a

¹ Special types of pump have been described by Mr. Vendelmans.

better method, which, however, is not yet within the realm of practical farming, but requires further study on a large scale.

The laboratory experiments show that manure can be stored not only without loss, but with considerable gain because ammonia is produced. The conditions necessary are complete exclusion of air and a warm temperature. Is it possible to attain these on the farm? It is certain that no amount of compacting by carts or animals will give complete exclusion of air, and until this is done a rise of temperature only increases the loss as already shown. And if we cannot avoid loss while the manure is still under the beasts and constantly trodden by them, it is certain that we cannot avoid it in a heap where the compacting is much less and the exposure to air and weather much more. So far as we can see the only way of excluding air completely is to store the manure in an airtight pit or tank and arrange by fermentation or otherwise both for the exhaustion of the oxygen of the air and for the necessary rise in temperature. This, of course, is only a general indication of what is needed. The details would require careful working out to ensure that the gain in the manure would counterbalance the cost of the tank. But the laboratory result is important because it shows that the storage of farmyard manure need not be, as at present, a cause of loss, but might be a cause of gain.

It is difficult to suggest any plan in agriculture that is entirely new. Manure pits are very old, dating back at least to Roman times. We have found an illustration of one in Hailes' *Body of Agriculture* that might almost have been devised for the purpose. To this day pits are used in some parts of Ireland. The fact that they have not become general shows that they are not free from practical difficulties. The real objection, however, seems to have been their lack of tightness; water and air leaked in, and speedily destroyed any advantage that might have been gained. Now that the real principles have been discovered we have a better chance of dealing with the problem.

CONCLUSIONS.

1.—The exposure of manure to weather always leads to loss and never, so far as we can discover, to gain. In order to obtain the best results manure should be made in covered yards and applied to the land directly it is hauled out. This can be done in winter in most parts of England, but it is best left till spring in the north and in Scotland.

2.—Where a heap is necessitated by considerations of horse labour, &c., it should be compacted and sheltered. Straw thatched hurdles, or a layer of about six inches of earth, have answered where no better shelter was available.

3.—On dairy farms provision should be made to collect the urine in the cow houses. We consider the Belgian tank the best method for this purpose.¹ The solid manure and litter should be carried to a covered dungstead and compacted. A tank should be provided to take the drainings.

4.—Compacting and sheltering only delay the decomposition processes and do not entirely stop them. They are effective in winter, spring, and early summer, but they are apt to break down in late summer when the outside temperature is high. Summer storage of manure is very wasteful and may be a serious source of loss on farms where the acreage under roots or potatoes is insufficient to absorb all the manure produced.

5.—If, however, it were possible to store the manure entirely out of contact with air a rise of temperature would be actually helpful and not harmful. Under these conditions there is not only no loss, but a positive gain in value of the manure. We hope to be able to make the necessary large scale trials in the near future.

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Harpenden

WELSH BLACK CATTLE.

ONE of the Welsh Triads speaks of the "three chief cows of the Isle of Britain" as being *Brech*, the cow of Maelgwn Gwynedd; *Tonllwyd*, belonging to the sons of Olifer Gosgordd-fawr; and *Cornillo*, the cow of Llawfrodedd Farfawg. With the possible exception of the third, the meaning of whose name is obscure, the black cattle which are now specifically associated with the Principality have not inherited their colour at least from any of these. We have no information about these cows beyond what is given in the Triad, but what is contained there, meagre though it be, is of considerable interest, as in the case of two of the cows at least the names by which they are called are indicative of their colours. The first, *Brech*, was apparently speckled, and the second, *Tonllwyd*, seems to have been dun. It is difficult even to suggest a meaning for the name of the third, *Cornillo*, and all that can be said is that the word in its present form would appear to refer to some feature relating to the horns rather than to the coat colour.

References to cattle colours are frequent in early Welsh literature, and these, with other material from the same source, furnish valuable information not only as to the ancestry of

¹This is speaking with regard to the conservation of liquid manure; the sanitary aspect of the Belgian method is a matter for further consideration.

modern Welsh cattle, but also concerning the wider subject of the early history of British cattle in general. It is evident from these allusions that there was in mediæval Wales a great diversity of colours in cattle, denoting, it may be conjectured, a variety of races, all of which have probably contributed in some degree to the making of modern British breeds. In addition to that already quoted, another of the Triads mentions the "three chief oxen of the Isle of Britain." One of these, like the cow *Brech*, was "speckled," another was "brown," and the third was "yellow." We know from other sources, the Welsh Laws in particular, that white cattle with red ears were common, and were evidently highly prized. While there is evidence of the existence of black or dark-coloured cattle at an early period, the references in mediæval Welsh literature to black cattle as such are somewhat rare. Moreover, such early allusions as we have seem to indicate that the black cattle were considered an inferior variety, especially in comparison with the white cattle mentioned in the Welsh Laws. The manner in which the colours are specified in the Triads also seems to point in the same direction.

The Triads here quoted are by no means the oldest source in Welsh literature from which information as to cattle may be gleaned. Some of the matter contained in these particular Triads, however, is certainly of great antiquity and may indeed take us back far into prehistoric times. We find allusions to the "speckled ox" in the earliest of the ancient books of Wales, and it is evident from the manner in which the references are made that, like some of the allusions to certain heroes of a long past age, they are the echoes, so to speak, of a very early tradition. The "yellow" and the "brown" oxen of the story of *Kilhwch*, a much older production than the Triads mentioned here, may, no doubt, lay claim to a like antiquity. It is beyond the scope of the present article to discuss these and other early references at length, but they are of undoubted interest in their bearing upon the early history of cattle in Wales.

Both from early tradition and from positive later evidence, it is clear that the cattle of Wales were, until comparatively recent times, strikingly varied in character and appearance. Amongst the different races then found in the Principality there must have been a small black or dark race which, though inferior in value, and found perhaps only in certain parts of the country, subsisted more or less alongside the white, the brown, and other more fashionable breeds, and has persisted, even to the exclusion of its once highly-favoured rivals. This black race was probably of the same origin as the black cattle which were common in other parts of the British Isles,

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References to cattle colours are frequent in early Welsh literature, and these, with other material from the same source, furnish valuable information not only as to the ancestry of

¹This is speaking with regard to the conservation of liquid manure; the sanitary aspect of the Belgian method is a matter for further consideration.

modern Welsh cattle, but also concerning the wider subject of the early history of British cattle in general. It is evident from these allusions that there was in mediæval Wales a great diversity of colours in cattle, denoting, it may be conjectured, a variety of races, all of which have probably contributed in some degree to the making of modern British breeds. In addition to that already quoted, another of the Triads mentions the "three chief oxen of the Isle of Britain." One of these, like the cow *Brech*, was "speckled," another was "brown," and the third was "yellow." We know from other sources, the Welsh Laws in particular, that white cattle with red ears were common, and were evidently highly prized. While there is evidence of the existence of black or dark-coloured cattle at an early period, the references in mediæval Welsh literature to black cattle as such are somewhat rare. Moreover, such early allusions as we have seem to indicate that the black cattle were considered an inferior variety, especially in comparison with the white cattle mentioned in the Welsh Laws. The manner in which the colours are specified in the Triads also seems to point in the same direction.

The Triads here quoted are by no means the oldest source in Welsh literature from which information as to cattle may be gleaned. Some of the matter contained in these particular Triads, however, is certainly of great antiquity and may indeed take us back far into prehistoric times. We find allusions to the "speckled ox" in the earliest of the ancient books of Wales, and it is evident from the manner in which the references are made that, like some of the allusions to certain heroes of a long past age, they are the echoes, so to speak, of a very early tradition. The "yellow" and the "brown" oxen of the story of *Kilhwch*, a much older production than the Triads mentioned here, may, no doubt, lay claim to a like antiquity. It is beyond the scope of the present article to discuss these and other early references at length, but they are of undoubted interest in their bearing upon the early history of cattle in Wales.

Both from early tradition and from positive later evidence, it is clear that the cattle of Wales were, until comparatively recent times, strikingly varied in character and appearance. Amongst the different races then found in the Principality there must have been a small black or dark race which, though inferior in value, and found perhaps only in certain parts of the country, subsisted more or less alongside the white, the brown, and other more fashionable breeds, and has persisted, even to the exclusion of its once highly-favoured rivals. This black race was probably of the same origin as the black cattle which were common in other parts of the British Isles,

including large portions of England. Modern Welsh Black cattle, while not exclusively descended from this early dark stock, may be regarded as having inherited from them some of the features which distinguish them to-day, in particular, perhaps, those remarkable qualities of hardiness and adaptability to which in a great measure may be attributed the survival of the race. As to the antiquity of their lineage there can be no doubt. The only question is the degree to which they are indebted to other early races for some of their qualities, and how far in the course of centuries they were influenced by these. To measure the extent of this influence is difficult, but, while Welsh Black cattle still retain some of the features that distinguished their black or dark ancestors of early times, other characteristic features of the modern breed are almost certainly due to an admixture of blood derived from the white, the brown, the dun, and the "speckled" cattle which were considered worthy of specific mention in early Welsh literature, and which in fact are not yet wholly extinct.

The diversity of colour and type which was so marked in early times remained a feature of the native cattle of Wales down to the end of the eighteenth century and later. The observation of William Marshall that "every province of the Principality seems to send out a separate breed" has often been quoted, and the variations which it indicates is amply confirmed by other writers of Marshall's time. There is, indeed, among unimproved Welsh cattle, even at the present day, a considerable variation in colour, which is not due to recent crossing with English or other breeds. Red cattle are not uncommon, brindle and dun are to be found, and black cattle with a white dorsal stripe are numerous in parts of North Wales. The persistence of this last marking, and its definite character, seem to suggest a long line of descent, and some have even stoutly maintained that these picturesque cattle with the dorsal stripe, and not the pure black, are the true representatives of the ancient native cattle of Wales. It is probably as true that they represent one of the early native breeds as that the modern Welsh Black cattle represent another. In any case, from the eighteenth century onwards, black has been the dominant colour of Welsh cattle, and it has now long been the distinctive mark of the recognised Welsh breed, and a feature that is emphasised in the breed's official title.

Eighteenth and early nineteenth century writers on Welsh cattle speak of three main native breeds—the Glamorgan, the Pembroke, and the Anglesey. The cattle of other parts of the Principality were regarded as much inferior to these, and were described as largely nondescript. The Glamorgan cattle had a white dorsal stripe, with a considerable amount of white under

the body, and not infrequently white faces, and were otherwise usually dark brown in colour. They were, indeed, sometimes known as "Glamorgan browns," and were once held in high repute. We are informed that King George III. regarded the breed with especial favour, and that his agents regularly visited the county to select the best cattle that could be found to keep up his Majesty's herd at Windsor. But even the exalted patronage of Royalty did not enable these interesting and evidently valuable cattle to survive the invasion of their country by more modern breeds. They deserve mention here not merely on account of the many merits which they possessed, but because they must be acknowledged as having contributed, probably through the Pembrokes, some of the elements that have gone to the making of the modern Welsh Blacks. It is noteworthy also that, while they no longer exist as a breed, the cattle with the dorsal stripe, which as indicated are still commonly found in parts of Wales, bear in their markings a certain resemblance, and are probably allied, to the old breed that was once the pride of the men of Glamorgan.

The Pembroke cattle were generally black but some of them had the white dorsal stripe, with some white on the tail and under the body. A few apparently had white or speckled faces, indicating their relationship to the Glamorgan breed. They were found not only in the county from which they took their name, but also in the adjoining counties of Carmarthen and Cardigan. The Pembrokes had a high reputation in the late eighteenth and early nineteenth centuries, both as milkers and feeders, though it appears that they were not considered equal to the Glamorgans for rapid feeding. Their meat was regarded as equal to that of Scotch cattle, and the impartial Youatt says that "some epicures even preferred it."

The Anglesey cattle were the best of the native cattle of North Wales. They were black, with not infrequently, however, a little white under the body. Most of the early writers agree that the Anglesey cattle were as a rule somewhat smaller than the Pembrokes, but describe them as being wonderfully hardy and excellent grazers, much in demand in the English Midlands and elsewhere. The black cattle of Lleyn, in Carnarvonshire, were of the same type but apparently less weighty.

The present Welsh Black breed had for its immediate ancestors the Pembroke and Anglesey cattle described above, the former unquestionably being related to the old breed of Glamorgan. A century ago or less there was, as has been shown, a good deal of white in Welsh cattle, especially the southern breed. But with the efforts at improvement which began then, or soon after, there was shown a general preference

for unbroken black, and the white, like the red, has now been practically eliminated in well-bred herds, although a little white on the udder is not a disqualification for show purposes. The first organised efforts to improve the breed were made about fifty years ago. A few progressive breeders, impressed by the results of systematic methods of breeding and selection in other breeds of live stock, endeavoured to form a society for the purpose of starting and publishing a Herd Book for the Welsh breed. But they proved to be too much in advance of their generation, and the response to their appeal was, at the time, disappointing. The effort, however, was renewed a few years later with better results, for a Herd Book for Welsh Black cattle was successfully instituted, the first volume appearing in 1874. The originators of this movement were largely from Pembrokeshire and the adjoining districts, although a number of northern breeders also gave it their support. After some years, however, a disagreement between the representatives of the North and the South led to the establishment of a separate Herd Book for the black cattle of North Wales. After this, for a period of twenty-one years, the breeders of North and South Wales maintained their respective organisations and published separate Herd Books. While probably of the same origin, and certainly of the same general character, there can be no doubt that the type of cattle favoured by the breeders of North Wales was somewhat different from that which was the ideal of their southern countrymen. Eventually, however, after many conferences, the two Herd Books were amalgamated, and it was decided that the two types should no longer be regarded as officially distinct breeds. The first volume of the united Herd Book was published under the auspices of the reorganised Welsh Black Cattle Society in the autumn of 1905. It is with the merits of the breed as at present recognised by the Welsh Black Cattle Society, and with its present position, that the remainder of this article is mainly concerned.

Welsh Black cattle are a general purpose breed, which naturally combines beef- and milk-producing qualities in a degree that is scarcely excelled by any British breed. To English graziers Welsh Runts have been known for generations as useful out-liers, hardy and active, which, when the summer grass comes, have an astonishing capacity for producing heavy carcasses of a quality that will rank with the choicest. At home, where, as a rule, the steers have fewer opportunities of displaying their merits in this respect, the cows are known and appreciated as good and profitable milkers, which are frequently in request for herds kept exclusively for dairying. General utility, thriftiness, and a hardy constitution are qualities that



WELSH BLACK COW, "GLYN MAIR"

must always commend a breed of cattle. They are qualities, however, that frequently carry with them certain characteristics which the modern cattle owner regards as defects. Great hardiness, which enables a lot of yearlings to thrive on the scanty fare provided by a poor hill farm, or a lot of steers to withstand in the open field the rigours of a hard winter, does not, as a rule, go hand-in-hand with rapid growth and early maturity, and is not the quality that the breeder or feeder who aims at quick returns specially looks for. Similarly the dairyman, whose object is exclusively the production of milk, will not give preference to a cow that is said to make up for a moderate milk yield by a certain aptitude to fatten when her period of lactation is at an end. The specialist, therefore, may neither value duality nor even hardiness, as such, however desirable these may be under given circumstances. It must be recognised that Welsh Black cattle, if we look at the ordinary commercial stock of the country, have the defects of their qualities, and that, in general, they are a class of cattle which have supreme merits for a particular system of breeding and rearing, but which may not so well meet the requirements of those to whom conditions of soil, climate and marketing, render a different system more profitable. They are as a breed slower than some others in arriving at maturity, but this, after all, is not so serious a drawback, having regard to the nature of the established trade in Welsh Black cattle, as many might think. It may be said of them at least that there are scarcely any cattle that more handsomely make up at three years old for the comparative slowness of their yearling growth. Moreover, rapid growth and early maturity, while to some extent no doubt racial characters, are largely determined by the method of breeding and feeding. Under a system of management favourable to rapid development, where they are given a fair chance of showing their capabilities, Welsh Black cattle have amply proved at the great fat stock shows and elsewhere that, even on the ground of early maturity, many of them compare not unfavourably with recognised early maturing breeds. Steers at three years old or slightly under, as in the older steer class at the fat stock shows, will attain to a live weight of from 14 to 16 cwt. and over, and show an average daily live weight gain of from 1.5 to 1.7 lb. At the 1916 Smithfield Show, the average weight of the exhibits in this class was 15 cwt. 33 lb., and the average daily live weight increase 1.62 lb.

The selected and indulgently treated exhibits at the Birmingham and Smithfield Shows, while they demonstrate the remarkable possibilities of Welsh Black cattle as a breed, are of course much superior to the general average of the ordinary Welsh Black stock of the country. At a fair or mart

a buyer would certainly observe much inequality in many of the lots of Welsh Black cattle offered for sale. He would note that in many cases a large proportion of the animals in a lot were hard-skinned, high-rumped, flat-ribbed, or light in the thigh. Judged from the feeder's standpoint, these are the common defects of the Welsh Black cattle. They are, in fact, the common defects of many breeds and are only to be remedied by the application of those methods of improvement by which the breeder has effected so much in other breeds. Much improvement, indeed, has been made in Welsh Black cattle during recent years. The exhibits at the various shows, both of breeding and fat stock, are markedly superior to what was common twenty years ago. There is greater individual merit, as well as more uniformity, and there is also an increasing number of exhibitors. It is true that the classes in the great English shows which make provision for the Welsh breed are frequently small, but at some Welsh shows, and notably the Welsh National, where the best exhibition of Welsh Black cattle has been seen in recent years, the classes are frequently very large. It is gratifying to find also that among the successful exhibitors of Welsh cattle, both in and out of Wales, are many comparatively small tenant farmers.

At the fat stock shows, the aged steer classes perhaps best demonstrate the outstanding merits of the Welsh Blacks as butchers' cattle. It has already been indicated that it is as butchers' cattle that the breed has mainly made its reputation outside Wales. For this purpose they have made a definite and an important place for themselves in the English market, of which no rivals have so far succeeded in depriving them. The retention of its position in this particular market is of supreme importance to the breed, and Welsh breeders, having no appreciable colonial or foreign outlet, are well aware of this. Welsh Black cattle are inherently as useful a dual purpose breed probably as any we possess in the British Isles, but there is always a tendency in breeding to give a particular direction to the process of improvement with a view to meeting the requirements of a particular trade, with the result that the improved breeds have, generally speaking, become more or less highly specialised. A certain degree of specialisation there must probably always be in Welsh Black cattle if they are to supply the same market as they have hitherto done. The tendency at present with most breeders is certainly, in the main, to breed for beef. That the Welsh breed responds in this respect to skilful treatment on the part of the breeder, and can, when so treated, hold its own against other breeds in open competition is amply proved by the records of Welsh exhibits at Smithfield, both as regards daily live weight increase and quality of

carcass. The ordinary farmer's stock, although in many cases it lacks the uniformity, the symmetry and the quality, which are essential possessions for a breed under modern market conditions, is also improving, and the rate of improvement was perhaps never as great as it is at present.

While the Welsh steer by its merits as a butchers' beast is mainly responsible for the reputation of the Welsh Black breed, the Welsh cow has nevertheless some claim to recognition as a milker. Where systematic records have been kept they have shown that, both as regards daily yield and butter-fat content, Welsh Black cows possess great merits. Welsh cattle, indeed, had they been developed on these lines, might have found a recognised place among the "milking" breeds of this country. Individual cows have been known to give 800 gallons, and on rare occasions even 1,000 gallons in a year. Such yields, however, are uncommon, and give no indication as to the general average yield of the breed. Nevertheless, the position occupied by Welsh Blacks in the rural economy of the Principality is in no small degree due to their milking qualities, although dairying has not been at any time the exclusive purpose to which the breed has been put in its native country. A characteristic feature of Welsh farming, however, has always been the combination of calf-rearing with butter-making. It is only with a breed that produces under ordinary conditions at least a fair amount of milk that such a system is possible. It was commonly affirmed at one time that the Pembroke cattle were better milkers than those of North Wales. This opinion was based largely on the performance of individual cows, or at best particular herds, and in the absence of actual records there is but little evidence in support of the claim. The same is in a measure true as to the supposed superior feeding qualities of the northern variety, but it is undeniable that when they were regarded as separate breeds a well-fed North Wales steer showed, in general, more of the recognised features of a typical butchers' beast than did his relative of the South. Any distinctive features, however, that may originally have separated the Black cattle of South Wales from those of the North are now being obliterated as a natural result of the amalgamation of 1904. Certain characteristic differences in appearance may still often be observed. The South Wales cattle are frequently longer in the body than the North Wales type, which are thicker and on the whole more symmetrical and compact. They both have fairly long horns, which are in general wider and less graceful in typical specimens from the South than in those from the North.

While individual breeders have for a long time shown in their own herds what could be done in the way of improving Welsh

Black cattle, their example and the results which their enterprise and methods produced, have now, as already indicated, begun to tell upon the breed more generally. There has recently been a marked increase in the number of those who own and breed registered stock. The awakened interest displayed by Welsh breeders during the past two or three years has been remarkable, and the period may be looked upon as in many ways the most important in the history of Welsh Black cattle as a breed. While the work of the pioneer improvers, and the efforts of the Welsh Black Cattle Society, were undoubtedly already exerting an influence on the breed in the desired direction, the present activity of Welsh cattle breeders is in a large measure due to the establishment by the Board of Agriculture and Fisheries of the Live Stock Improvement Scheme, financed as it is, out of the Development Fund. In no part of the country has that Scheme been more readily taken up than in Wales, and there are few places where a better concrete example could be furnished of the effects of such a scheme on an entire breed, even in the short time it has been in operation, than in the case of Welsh Black cattle. It is not to be assumed, of course, that the beneficial effects of the Live Stock Scheme in Wales have been confined to Welsh Blacks, for there are other breeds in Wales, and the bulk of the cattle of the Principality are, in fact, not of the Black breed. Out of 180 grants available for bulls under the Scheme in Wales, 36 are at present awarded in respect of Welsh Black bulls, and these are located as follows:—Anglesey, 10; Carnarvonshire, 9; Denbighshire, 3; Merionethshire, 8; and Pembrokeshire, 6. It will be seen that three-fourths of the bulls are located in the counties of Anglesey, Carnarvon, and Merioneth, and this indicates generally where Welsh Black cattle are mainly to be found. Here they have maintained their position, and are, perhaps, now more firmly established than they have ever been. In the southern counties, however, they have certainly lost much ground in the past twenty years, although there are still many Welsh Blacks bred in Pembrokeshire, as may be inferred from the number of Scheme bulls in that county. There are also some in Carmarthenshire, and a few herds of great merit in North Cardiganshire.

The systematic use of superior bulls, and the improvement that is already beginning to appear in consequence of that, will lead also, no doubt, to improved methods of rearing and general management. The practice in regard to methods of rearing might in many places be greatly improved. In general, where the common system of butter-making combined with calf-rearing is carried on, the calves are frequently put on a somewhat hard fare from the outset. It is naturally the object to save the

whole milk or the cream for churning, and the calves are, therefore, put on separated milk, oatmeal gruel, and buttermilk, with or without added cream substitutes, such as linseed or prepared calf meal, as early as possible. The calves are usually dropped from January to March, and, after a varying length of time on whole milk, are fed as indicated above, with hay, when they are old enough to eat, and sometimes a few crushed oats in addition for about three or four months. They are turned out on grass about June, and sometimes are given separated milk or gruel and buttermilk for a time after going out to grass. Oatmeal gruel is a very common calf-food, and to its use must be attributed the fact that so many Welsh calves are reared with at least a great measure of success, with extremely little, very often, in the way of the recognised concentrated calf foods being employed at all. For their first winter, the calves are housed frequently under very unsatisfactory conditions in regard to accommodation, and in cases where there is but little land under tillage, are fed on hay, with or without some small allowance of crushed oats or meal. After another summer's grazing, or before in some cases, they generally leave the farms where they have been bred, being sold as yearlings to be kept on for another year as stores. It is usually at this age, namely, from two to two and a half years old, that Welsh steers go in such large numbers to the grazing districts of the English Midlands and elsewhere.

The method of rearing that has been described may be regarded as typical of the hill farms, where the winter keep for stock is often limited in quantity, and at best does not furnish a very rich diet. There could be no stronger testimony to the merits of Welsh Black cattle than that they should do so well at maturity when the conditions under which they are reared are often so unfavourable. Whatever may be said of them in comparison with other breeds, it may certainly be claimed for Welsh Blacks that, having regard to the manner in which so many of them are treated during the early stages of their growth, there are scarcely any cattle that grow into money as they do, although it is admitted that they take their time to do it. On the better farms, the method of rearing is different, and the diet is both richer and more varied than on the hill farms. Liberal treatment shows itself, of course, in more rapid growth, and generally in the more thriving condition of the young stock. The hill farmer, though he may be well aware of the lesson which this teaches, is often at a disadvantage when he tries to put it into practice in his own case. Liberal hand feeding in rearing means in many cases the continued use of some concentrated food after the calves go out to grass, unless they are to go back in condition. It is one of the ways in which many

of those who breed Welsh cattle are handicapped, that it is often difficult, owing to the inferior character of the pasture, to keep young cattle from losing their calf flesh. Nevertheless, in spite of the difficulties, this is one of the directions in which, by the adoption of better methods, much loss could be avoided, and the general improvement of the breed could at the same time be accelerated.

The present position of Welsh Black cattle as a breed, while there is much yet to be done before it has reached a state of even relative perfection, is in many ways a satisfactory one, and the outlook is distinctly encouraging. The representatives of the breed exhibited outside Wales have, in recent years, been the subject of increasingly favourable comment, and the interest in the breed at home is probably greater than it has been at any time. It is significant that the last volume of the Welsh Cattle Herd Book, published in 1916, contains a larger number of entries than any previous one. These consist of 275 bulls and 548 cows, excluding the registered progeny. The Welsh Black Cattle Society, whose Secretaries are Messrs. James Thomas & Son, Haverfordwest, is an active and flourishing body, and has now a membership of 136. The present prosperity of the Society and of the Welsh Black breed is in no small measure due to the comparatively small band of breeders, landowners and tenant farmers, who persevered in their efforts to improve the breed and to bring its merits to the notice of a larger public, at a time when the general interest in the breed was much less than it is now, and long before any State-aided measures for its improvement had been formulated or even thought of. With combined action on the part of many breeders, which has now become possible, and a wise discrimination in the selection of the breeding stock, there is every reason to believe in an important future for the breed. Its ultimate destiny is a matter which, after all, is mainly in the hands of the breeders themselves, for while State assistance in the form of money grants, and organisation in the form of societies and clubs furnish valuable means to an end, it is to the exercise of judgment and skill on the part of the breeders individually and collectively that we must look for that future type of Welsh Black which, by combining the character of the old race with perfected economic features, will secure recognition as one of the most valuable assets of this country.

C. BRYNER JONES.

PALM KERNEL CAKE AND MEAL.

INTRODUCTION.

IN the year 1865 an article by Dr. Augustus Voelcker was published in this Journal⁽¹⁾, in which he drew attention to a then "comparatively speaking, new feeding material," palm kernel meal, which was being produced by Messrs. A. W. Smith & Co., of Liverpool, and which he cordially recommended to the notice of farmers. This article recorded favourable experience in the use of the meal at the Royal Agricultural College, Cirencester, after the removal of certain initial prejudices which then—and, it is to be feared, still—beset the introduction of a new feeding stuff. It was recorded further that the meal had gradually found its way amongst farmers, and "all who have given it a fair trial speak in the highest terms of its fat and milk producing properties." In view of subsequent developments it is of interest to note that about the same time references to this feeding-stuff began to appear in German agricultural literature, with the common lament that the palm kernel cake made in Hamburg was being exported to England because no sale could be obtained for it in Germany.

This promising start of the new feeding-stuff in this country was unfortunately not maintained, the decline being partly due to the steady reduction in the oil content of the cake with improvement in the process of extraction of the oil, and partly also to the steady diversion of the kernels to Hamburg, causing supplies in this country to become more and more irregular. For three or four decades prior to the outbreak of the present war comparatively little palm kernel cake (or meal) was purchased as such by the British farmer, although considerable quantities of it have been incorporated from time to time in various proprietary compound feeding cakes and meals. During the same period, however, the popularity of the cake in Germany, Holland and Scandinavia has steadily increased until at present it enjoys there a reputation as food for dairy stock which is surpassed probably by no other oil-cake.

With the outbreak of war attention has now been very forcibly directed to this divergent experience, not only on account of the desirability of increasing the supplies of feeding stuffs for our home agriculture, but in view of the great Imperial interests involved in the diversion of the trade in palm kernels to this country.

NOTE.—The figures in brackets refer to the summary of literature at the end of the article (pp. 61 and 62).

What these interests are may be briefly summarised by an extract from the Report (-) issued in June, 1916, of the Committee appointed by the Colonial Office "to consider the present condition and the prospects of the West African trade in palm kernels and other edible and oil-producing nuts and seeds." The following data as to the exports in 1913 of palm kernels and derived products from West Africa are extracted from Table I. of that Report :—

Values in thousands of pounds sterling.

	To all Countries	To United Kingdom	To Germany	To other Countries
	£1,000	£1,000	£1,000	£1,000
Palm kernels . . .	4,199	681	3,314	201
Palm kernel oil . .	129	129	—	—
Palm kernel cake . .	31	—	31	—
Palm oil	1,977	1,614	242	91
Total of above . .	6,336	2,451	3,587	295

"The trade in palm kernels amounted in 1913 to over 5,000,000/., or one-half of the total exports from West Africa. Of this great total over 4,250,000/., or four-fifths of the whole, came from British Possessions. Yet three-quarters of it went to Germany to be milled." It is also of interest to note that whilst the relatively small quantity of palm kernel oil extracted on the spot came to this country, the residual cake went to Germany. The absorptive capacity of British industry for oils is evidenced by the high proportion taken of the palm oil, which, however, although derived from the same palm fruit, must not be confused with the more valuable palm kernel oil. Moreover, considerable quantities of the palm kernel oil extracted in German mills have been imported into this country.

The report referred to above affords gratifying evidence that much has already been done in the past two years in the direction of developing this important industry in this country. As a result of their investigations the Committee have satisfied themselves that ample capacity can be provided in the United Kingdom for crushing the whole of the kernel crop as efficiently as in German mills. As regards the products there seems little reason to doubt that the oil can be satisfactorily disposed of, but there must be a similar certainty of disposal of the cake if the industry is to compete successfully with the powerful German industry after the war.

It would appear, therefore, that success largely hinges upon the creation of a large and steady demand for palm kernel cake in this country, and it is, obviously the bounden duty of the British farmer to give at least a fair and thorough trial without delay to this important feeding-stuff. Self-interest alone should be sufficient to persuade him to this course, since the benefits to agriculture of an increased range of choice and increased supplies of feeding-stuffs are too obvious to require exposition. With a view to stimulating and facilitating such an extension of the use of palm kernel cake and meal a summary is given in the following pages of the information at present available with regard to the composition and general nutritive properties of these feeding-stuffs.

ORIGIN AND NATURE OF PALM KERNELS.

The palm kernels of commerce are derived exclusively from the African oil-palm (*Elæis guineensis*) which grows in immense numbers over a vast tract of West and Central Africa for a distance of about 10° on each side of the Equator. It is particularly in the coastal region that dense forests of the tree are found.

This palm produces annually four, or occasionally even five crops of fruit. The individual fruit-heads consist of a large conical-shaped cluster, in appearance not unlike a giant strawberry, each fruit-head carrying attached to its core some 600 to 800 individual fruits. The total weight of the cluster may range from 40 lb. to 110 lb., the fruits forming 16 lb. to 22 lb. of this total. In size and in general structure the fruits resemble plums, having at their core a kernel enclosed in a hard shell, which is surrounded by a pulpy layer (pericarp) enclosed by an outer skin.

The pulp or pericarp of the fruit is rich in oil which is extracted by the natives using very crude processes, and furnishes the *palm oil* of commerce. According to analyses made at the Imperial Institute the percentage of palm-oil in the fruits may range roughly from 15 to 40 per cent., but the proportion recovered by the natives is commonly little more than 10 per cent.

After the removal of the palm-oil the shell-covered kernels are separated from the pulp, and the kernels freed from the shells by cracking with stones or by means of machinery specially devised for the purpose. Upon the care with which this cracking is done depends much of the value of the palm kernels as received at the mill, and incidentally of the palm kernel cake or meal subsequently prepared therefrom. At one time considerable proportions of shell were found in imported

kernels, but in recent years there seems to have been marked improvement in this respect.

The kernels thus obtained have usually a dark brown or almost black outer skin, are roughly spherical in shape and resemble marbles in average size. They contain usually 8 to 10 per cent. of albuminoids, and 45 to 55 per cent. of oil. The latter was originally used entirely for soap-making, but in recent years it has been used more and more extensively in a refined condition for the manufacture of margarine. In general appearance and in chemical character it closely resembles coconut oil. Like the latter it is distinguished from most vegetable oils by its relatively high content of glycerides of fatty acids of low molecular weight (lauric, capric, caprylic and caproic acids). This being also one of the features of the composition of butter-fat it is of interest to note that special claims as butter-producing foods are made for palm kernel and coconut products. These claims will be further discussed later.

MANUFACTURE OF PALM KERNEL CAKE AND MEAL.

The extraction of the oil from palm kernels is effected at the present day by two different processes, the one giving rise to palm kernel cake and the other to palm kernel meal.

The former process is the older and more widely used, and may be referred to as the pressure process, since the oil is extracted by placing the finely ground kernels in thick layers separated by perforated metal plates in very powerful hydraulic presses. The greater part of the oil is thereby squeezed out, and the residual material left behind as compact "cakes." Since palm kernel oil is semi-solid at ordinary atmospheric temperatures it is necessary that the ground kernels before pressing should be raised to a comparatively high temperature (190° to 200° F.), and that the whole process should be carried out in a warm atmosphere.

In the alternative and newer process, the extraction process, the removal of the oil from the palm kernels is effected by means of a volatile solvent such as naphtha (gasoline or light petroleum), carbon bisulphide, or trichlor-ethylene. In order to secure efficient extraction it is essential that the kernels be finely ground or rolled. After thorough treatment with the boiling solvent, the solution containing the oil is drawn off, and the residual meal heated to remove every trace of the solvent. Meal obtained in this way is sold under the name of Extracted Palm Kernel Meal, and should not be confused with Palm Kernel Cake Meal, which is simply ground cake.

The extraction process commonly removes a greater proportion of oil from the kernels than the pressure process, and consequently the extracted meal is generally poorer in oil than

the cake. It is further possible that the more searching effect of the solvent may remove from the kernels along with the oil other ingredients present in minor proportions, but possibly not of minor importance as regards the nutritive value of the residue. No evidence has yet been adduced, however, of any such removal of important ingredients other than oil, and it is reasonable at present to assume that the difference in oil content is the only important difference in composition between the cake and the extracted meal.

COMPOSITION AND GENERAL CHARACTERISTICS OF PALM KERNEL CAKE AND EXTRACTED PALM KERNEL MEAL.

Both cake and meal are usually light grey in colour, with a characteristic mottled appearance owing to the presence of dark particles consisting of fragments of the outer skin of the kernels, together with any shell with which the kernels may have been contaminated. As a rule when freshly made they are practically tasteless, and have no smell or at most only a faint fruity aroma. On keeping they soon develop a nutty odour, owing to partial decomposition of the oil, and after a considerable time this acquires a rancid character. Owing to the high temperatures used in their preparation the fresh cakes usually feel hard and dry, but on exposure to damp air they quickly absorb moisture, become much softer and tend to crumble. In the mouth both cake and meal have a harsh gritty feel, which does not disappear after prolonged mastication. On stirring up with water they do not swell in the way that coconut cake and meal do, but remain "gritty," and soon accumulate as a layer at the bottom. If kept for some time in contact with hot water they are said to develop an unattractive smell and flavour, but the writer has never observed any such change.

In appearance the cake and extracted meal differ but little, save that the latter is usually more fluffy in character, and has a somewhat harsher feel. Different makes of cake and meal differ in composition mainly with regard to the content of oil and crude fibre. The appended data will furnish guidance as to the average composition and usual range of variation. For comparative purposes the German averages as given by Kellner are included in the table.

It may be noted that the albuminoid content is lower than in any other oil-cake used on British farms. The oil content of the cake varies from mill to mill, but, generally speaking, it is intermediate between that of good linseed cake and that of undecorticated cotton cake. With the latter cake there is a fairly close resemblance in general chemical composition, *i.e.* as regards albuminoids, oil, carbohydrates and fibre. It should be noted that the palm kernel cake now being produced in this

Palm Kernel Cake.

	Common range of variation in British makes	Average	German average (Kellner)
	Per cent.	Per cent.	Per cent.
Moisture	9 to 12	10	9.7
¹ Crude albuminoids	17 " 19	17½	17.7
Oil	6 " 10	7½	8.6
Soluble carbohydrates, &c.	42 " 48	47	36.2
Crude fibre	11 " 15	14	23.8
² Ash	3 " 6	4	4.0
		100	100.0
¹ Including true albuminoids		16½	?
² Including sand		½	?

Extracted Palm Kernel Meal.

Moisture	9 to 12	10	10.9
¹ Crude albuminoids	18 " 20	19	18.7
Oil	1 " 3	2	1.6
Soluble carbohydrates, &c.	46 " 52	49	39.1
Crude fibre	14 " 20	16	25.4
² Ash	3 " 6	4	4.3
		100	100.0
¹ Including true albuminoids		18	?
² Including sand		½	?

country contains far less crude fibre than Kellner's averages would suggest for German-made cake, and should be correspondingly more nutritious. There can be no doubt that an undue proportion of shell was ground with the kernels in the German mills, and the British figures indicate that there can be little excuse for a fibre content exceeding 15 per cent. in the case of the cake or 20 per cent. in the case of the meal. It may be noted in passing that Kellner claims a relatively high digestibility for the crude fibre of palm kernel cake, but the experimental data available lend little support to this view (see later, p. 55).

The average proportions of ingredients of manurial value present in the cake and meal are indicated below:—

	Nitrogen Per cent.	Phosphoric Acid Per cent.	Potash Per cent.
Palm kernel cake	2.8	1.3	0.8
Extracted palm kernel meal	3.0	1.5	0.9

Valued on the lines of the most recent pre-war recommendations of Hall and Voelcker, these figures would indicate

that an outgoing tenant should receive for each ton consumed under cover by fattening stock during the last year of tenancy 26s. 4d. in the case of palm kernel cake, and 28s. 10d. in the case of the extracted meal.

The older experience with palm kernel cake in this country has left a tradition that it does not keep well on storage. Practical experience during the past two years has given no support to this objection, and more precise comparisons made by Godden at the University of Leeds ⁽¹⁾ during the present year have demonstrated clearly that palm kernel cake compares favourably in this respect with most of the oil-cakes in common use. The only marked chemical change that takes place during storage is a progressive decomposition of the oil, with liberation of the fatty acids contained therein, the change generally taking place the more rapidly the lower the oil content of the cake or meal. It is doubtful whether this change, unless very far advanced, involves any serious lowering of the nutritive value of the cake. In any case, such splitting-up of the oil is not peculiar to palm kernel cake but takes place with practically all oil-cakes.

DIGESTIBILITY.

The outward characteristics of palm kernel cake and meal are not suggestive of high digestibility, but in this respect appearances prove to be deceptive. The digestibility has been determined experimentally both in Germany and recently in this country, and the results are concordant throughout in indicating a relatively high order of digestibility for the palm kernel foods.

Of the three German series of determinations only one ⁽¹⁾ is recent enough for the results to be fairly applicable to the cake and meal now manufactured. In the table given below the results obtained in this series are compared with those recently obtained by Crowther and Woodman ⁽³⁾ in tests made at the University of Leeds. In each case the animals used were sheep, but the results are probably fairly applicable to the case of consumption by cattle.

Percentage Digestibility.

(a) *Palm Kernel Cake.*

	German Experiment Per cent.	Leeds Experiment Per cent.
Total organic matter . . .	76.5	75.9
Crude albuminoids . . .	76.6	77.2 (Corrected, 91.0)
Oil . . .	78.7	97.5
Sol. carbohydrates, &c. . .	88.8	83.1
Crude fibre . . .	39.4	37.1
True albuminoids . . .	—	79.2 (Corrected, 90.9)

(b) Extracted Palm Kernel Meal

Total organic matter . . .	79.7	16.7
Crude albuminoids . . .	71.2	79.1 (Corrected, 90.0)
Oil . . .	1	96.4
Sol. carbohydrates, &c . . .	92.6	86.0
Crude fibre . . .	55.2	11.8
True albuminoids . . .	—	80.6 (Corrected, 89.7)

The two series of results are in satisfactory agreement in indicating that fully three-quarters of the organic matter of palm kernel cake and meal is digestible. The method of experiment used is known to be affected with errors which tend to make the results low. This is specially the case with the albuminoids, for which the necessary correction determined in the Leeds experiments brought the indicated digestibility up to 90 per cent.

The digestibility of undecorticated cottonseed cake (Egyptian) by the same two animals in the Leeds experiments was found to be very substantially less than that of the palm kernel cake, the results being as follows:—

	Per cent
Total organic matter . . .	58.0
Crude albuminoids . . .	67.3 (Corrected, 74.7)
Oil . . .	(100)
Sol. carbohydrates, &c . . .	62.0
Crude fibre . . .	31.9
True albuminoids . . .	66.3 (Corrected, 72.0)

Taking both composition and digestibility into account, and assessing the values by the commonly used "food unit" method, the palm kernel cake used was worth 35 per cent. more, and the palm kernel meal 23 per cent. more per ton than the cottonseed cake used in the experiments. It would be rash to generalise as to the relative merits of these feeding-stuffs on the basis of these few data, but it can be asserted safely that palm kernel cake and meal fed to cattle or sheep rank with the most highly digestible of oil-cakes and are appreciably more digestible than undecorticated cotton cake.

It is further of interest to note that the German authority, Kellner, ascribes a high degree of physiological efficiency to the digestible ingredients of the palm-kernel foods.

The results of one German digestibility trial⁽⁶⁾ with pigs suggest that palm kernel cake is somewhat less readily digested by the pig than by sheep.

MERITS AS FOOD FOR STOCK.

For information as to the general merits of palm kernel cake and meal as foods for stock we have been until recently almost entirely dependent upon Continental agricultural literature. The great expansion of the palm kernel industry in Germany has led to the widespread use of these foods on

German farms, and general opinion as to their merits may be indicated by a few extracts from the standard treatises of Kellner (°) and Pott (').

Kellner writes that "palm kernel cake of normal character has but an indifferent taste, and is often not readily eaten at first, though the animals usually soon accustom themselves to the cake when fed dry. If treated with warm water, however, the cake develops an unpleasant flavour, and consumption becomes unsatisfactory. . . . All palm kernel by-products are used primarily for the feeding of milch cows, and for this purpose enjoy a great reputation because, like coconut cake they are said to increase the fat content of the milk. . . . They give good results also with fattening stock, but can only be advantageously used for this purpose when prices are low."

Pott says that, "owing to their palatability, ready digestibility, specific effects upon milk secretion, good keeping properties, and general suitability, these by-products of the oil industry are always in brisk demand, and consequently fetch a relatively high price. . . . Palm kernel cake or meal of the best quality is readily consumed by all classes of stock on account of its agreeable nutty aroma and flavour. As food for milk production it is unsurpassed, giving large yields of butter of the finest quality, and an easily churned cream. As much as 7½ lb. per head per day has been consumed by cows without any apparent detriment to the animals. When such large quantities are fed, however, the butter often acquires a hard, almost tallow-like consistency. The palm kernel foods may therefore be used as a corrective of such foods as maize or rape-cake, which tend to make the butter too soft. . . . The outstanding feature, however, is the favourable influence of palm kernel oil on the output and quality of the butter-fat, which has been repeatedly confirmed in practical experience. The limit of this favourable influence is reached as a rule with 1 lb. to 2 lb. (½—1 kg.) of good cake, and larger amounts are the less to be recommended seeing that palm kernel residues are, as concentrated foods, in many cases too poor in protein.

"With fattening pigs palm kernel cake has given very good results (in Denmark); it gives a firm fat. . . . As food for horses . . . palm kernel cake or palm kernel meal fed to the extent of 1 lb. to 2 lb. per head per day as substitute for oats has often given good results. Horses with weak digestion especially have done well on a mixture of oats and palm kernel meal; very severe attacks of colic in foals are said to have been quickly overcome by the use of the dry mixture. . . . A further contributory cause of the popularity of palm kernel foods is that they are rarely damaged and mostly free from injurious organisms."

It is clear from the foregoing extracts that palm kernel cake and meal enjoy a considerable reputation in Germany as safe foods for all classes of stock, and as particularly effective food-stuffs for milk-producing animals. We are no longer dependent, however, upon German opinion for our guidance, since at various agricultural colleges in this country experiments with palm kernel cake and the extracted meal have been carried out during the period of the war. A summary of these experiments (up to December, 1915) was prepared by the writer for the Edible Nuts Committee and has been printed as Appendix B to the Report of the Committee. For details of the experiments and a critical commentary on the results the reader must be referred to this Appendix, and only a brief summary of the general conclusions can be given here.

In experiments with fattening cattle at six centres palm kernel cake was compared with one or more of the following foods:—linseed cake, decorticated cottonseed cake, undecorticated cottonseed cake (Egyptian and Bombay), bran, and dried distillery grains. The following conclusions were drawn by the writer from a survey of these experiments:—

- (1) Palm kernel cake is a suitable food for fattening cattle.
- (2) When fed along with adequate amounts of roots, hay, or straw (or both), and corn (or other concentrated food) it is capable of giving results roughly equal to those given by the same weight of linseed cake, decorticated cotton cake or dried distillery grains, and definitely superior to those given by the same weight of Bombay cottonseed cake or bran.
- (3) In rations supplying apart from the cake only relatively scanty amounts of digestible albuminoids it will probably prove inferior to linseed cake and decorticated cottonseed cake. For this reason the results of comparisons with these foods are likely to vary greatly.
- (4) The evidence available is not sufficient to enable a statement of the precise relative feeding values of these foods to be given.

Five experiments with dairy cows were reported on as follows:—"The experiments with dairy cows demonstrate clearly that palm kernel cake is a suitable food for dairy cows, but in no case do they furnish any reliable guidance as to its precise value in comparison with the other foods used (decorticated and undecorticated cotton seed cake). Taken as a whole the results show little evidence of any appreciable specific influence of the palm kernel cake upon the production of milk-fat. On the other hand they by no means exclude the possibility of such influence being exerted. In order to decide

these points the experiments need to be repeated upon a very much larger scale, and with a variety of rations.

"Where observations have been made of the quality of the butter produced during the feeding of rations containing palm kernel cake, even up to $7\frac{1}{2}$ lb. per day, no appreciable detrimental effect has been noted."

Evidence was also placed before the Committee of favourable experience in Ireland in the use of palm kernel cake for milch cows, pigs, and horses.

Two further experiments with cattle, the results of which have been published since the foregoing summary was drawn up, have led to substantially similar conclusions.

In an experiment⁽⁸⁾ with fattening bullocks at Craibstone Farm, Messrs. Hendrick and Profeit have compared extracted palm kernel meal with linseed cake, undecorticated earthnut cake and crushed oats respectively, using four lots of eight two-year-old bullocks for the purpose. The foods compared were added to a basal ration of cut turnips and oat straw, but in order to secure a satisfactory consumption of the palm kernel meal it was found necessary to mix with it about one-quarter of its weight of locust bean meal. Judged by the live-weight records for the twelve weeks of the experiment the palm kernel meal was surpassed only by the linseed cake. Its apparent superiority over the other two foods seems, however, to have been mainly determined by the accident that two of the animals in the palm kernel meal lot gave extraordinarily high increases of live weight during the later stages of the experiment. The estimated monetary returns were lowest from the palm kernel meal lot, the cost of production in this lot being appreciably increased by the enforced inclusion of locust bean meal in the ration. The general conclusion is drawn that whilst extracted palm kernel meal is capable of satisfactorily fattening cattle, "it is not readily taken by stock, and the necessity for using a flavouring food along with it makes it at present prices" (linseed cake 13*l.* 2*s.* 6*d.*, palm kernel meal 9*l.* 15*s.*, locust bean meal 9*l.* 17*s.* 6*d.* per ton) "considerably dearer than linseed cake."

The influence upon yield and quality of milk and butter of palm kernel cake fed to cows on pasture has been the subject of a small-scale test included in the Leeds experiments⁽⁹⁾ previously alluded to. Five cows were used for the purpose, and the average yield and composition of the milk during the period in which the cake was fed were compared with the averages for the immediately preceding and immediately following periods in which no cake was fed. The comparison indicated a slight improvement in both yield and fat content of the milk with the use of the cake, the magnitude of the effects varying with the individual cows. On the average the effects were so

slight as to have little practical significance. More pronounced effects were shown upon the live-weight of the cows, and upon the characteristics of the butter-fat produced. The latter underwent a change such as might have been occasioned by the direct passage of small amounts of certain ingredients of the palm kernel oil into the milk-fat.

Attention has been directed earlier to the widespread belief in Germany that palm kernel cake does effect a specific and appreciable enrichment of milk in fat, and it must be admitted that very powerful experimental evidence in support of this belief has been obtained there.

A summary of this evidence (1) has been published recently by the writer, and one set of results of outstanding importance may be reproduced here. These results were obtained in 1910 in a co-operative experiment on a large scale, organised under the auspices of the Association of German Agricultural Experiment Stations, and carried out at nine centres, involving a total of 186 cows. With two exceptions (Oldenburg and Rostock) palm kernel cake was compared at each centre with an equal supply of nutrients given in the form of a mixture of ground-nut cake and maize. At Oldenburg and Rostock the supplies of nutrients compared were not exactly equal. A summary of the results is given below, the results with the "control ration" of maize and ground-nut cake being taken as 100 in each case :—

Experimental centre	No of cows in experiment	Palm Kernel Cake per head per day	Milk yield	Fat content of milk	Yield of fat
			Average yield on Palm Kernel Cake ration expressed as percentage of average yield on 'control ration'	Average percentage in milk during Palm Kernel Cake feeding expressed as percentage of average during feeding of 'control ration'	Average yield of butter fat during Palm Kernel Cake feeding, expressed as percentage of average yield during feeding of 'control ration'
		Lb	Percent	Percent	Percent
Bonn . . .	17	7.19	98.6	110.5	109.0
Danzig . . .	20	4.11	105.6	109.1	115.3
Greifswald . .	21	1.11	103.2	103.9	107.2
Hamburg . . .	18	1.85	100.1	110.7	110.9
Jena . . .	20	5.07	99.6	101.6	101.2
Triesdorf . .	20	5.51	100.7	107.7	108.7
Weihenstephan	20	5.73	100.3	100.2	100.7
Average of 7 centres	—	5.29	100.8	106.5	108.3
Oldenburg . .	15	3.97	103.4	112.1	115.9
Rostock . . .	21	5.29	100.4	111.2	111.8
Average of all (9) centres	—	5.29	101.0	107.8	109.2

These results seem to establish beyond dispute the claim that palm kernel cake, whilst having but little effect upon the yield of milk, can produce an appreciable increase in the percentage of fat in the milk, and consequently in the total output of milk-fat. It will be seen that the magnitude of the specific effect varied in the different experiments, and even greater variations were recorded in the data for the individual cows. It is clear, therefore, that the individuality of the animals must play an important part in determining the specific effect.

As already indicated very few experiments designed to furnish information as to this specific effect of palm kernel cake have yet been carried out in this country, and these only on so small a scale that the results do not furnish a safe basis for generalisations. So far as they go, however, they show in most cases little indication of any increase of the fat content of milk that is worth consideration in practice. The fat content of the milk produced on British farms is on the average appreciably higher than that of the milk of the common German dairy breeds. Thus, whereas Shorthorn milk on the average contains fully 3·7 per cent. of fat the average for the "control ration" periods at the nine centres of the above-mentioned German experiment was only 3·35 per cent., the averages for the individual centres ranging from 2·97 per cent. (Danzig) to 4·20 per cent. (Weihenstephan). It is, perhaps, significant in this connection that the last-named centre was the only one at which no appreciable specific influence of the palm kernel cake was recorded, although it is only fair to add that at this centre there were also other factors which would operate against the production of a measurable specific effect.

It is quite possible, however, that with our dairy breeds less scope is left for the improving influence of palm kernel cake than has been found with German herds.

Two tests of the value of palm kernel cake and meal in pig-feeding remain to be noticed. The first of these is an experiment conducted by Mr. J. A. Wylie, of the West of Scotland Agricultural College, on the Calderwood Estate of the Scottish Co-operative Wholesale Society, with two groups of sixteen pigs, each group being sub-divided into two lots of eight hogs and eight sows respectively. The one group received a ration of milling offals, maize, fish meal, and "pig meal," whilst the other group received the same ration with an addition of palm kernel cake, the latter forming two-sevenths of the total food consumed by this group. The whole of the food was given in practically dry condition. The pigs at the outset were about 14 weeks old, and made very satisfactory

progress throughout the experiment. On the average of the whole period the pigs receiving palm kernel cake showed a gain in live-weight of 1.26 lb. per head daily as compared with an average of 1.19 lb. for the other group, but consumed 0.5 lb. more meal per head per day than the latter. The margin of profit on the feeding was slightly reduced by the use of palm kernel cake, but the general conclusion is drawn that "when used in the proportion stated . . . palm-nut cake may be considered a suitable and economical food for fattening pigs." It is further stated that "no difficulty need be experienced in getting pigs to acquire a taste for palm-nut cake, after which it seems to have the effect of increasing their appetite."

An experiment on a similar scale (") with pigs has been carried out by the writer during the past summer (1916) at the Withgill Piggeries of the Co-operative Wholesale Society, Ltd. In this experiment palm kernel cake and extracted palm kernel meal were compared with each other, and with the grade of wheatmilling offals known variously as "fine sharps," "thirds" or "pollards," which is so widely used in pig-feeding. Three lots of eighteen pigs each were used for the purpose, each lot being sub-divided into three pens. On the basis of the increases in live-weight recorded, the pigs receiving "thirds" did rather better than those receiving an equal weight of palm kernel cake, and still better than the lot receiving the same weight of extracted palm kernel meal, although the differences were not very great. The cost of fattening was relatively greatest with the extracted meal and lowest with the palm kernel cake. The cake (or meal) formed up to two-sevenths of the total food supply, and up to this limit no digestive irregularities were experienced. The quality of the carcasses at the close of the feeding was pronounced eminently satisfactory.

It is clear, therefore, from these two experiments, conducted upon a fairly extensive scale, that palm kernel cake and meal can be safely included in the list of foodstuffs suitable for pig-feeding to be used when prices are favourable.

PALATABILITY OF PALM KERNEL CAKE AND MEAL.

It will have been noted that, except in one important particular, the reports as to the general merits of palm kernel cake and meal for farm stock, although perhaps not quite bearing out the eulogies of some German writers, are almost uniformly favourable. Throughout the reports on these experiments, however, there is practically unanimous testimony that cattle and sheep did not take well to the palm kernel foods at the outset, although, in the case of cattle at any rate, they were soon induced to eat it satisfactorily.

This difficulty, which is more pronounced with sheep than with cattle, would appear from investigations with cows and sheep made at Garforth (University of Leeds) ('), to be due not so much to any defect of flavour or aroma of the palm kernel cake, as to physical difficulties of mastication and swallowing, which arise presumably from the characteristic "grittiness" of the cake. It was observed that the consumption of the cake was accompanied by much coughing and an abnormal flow of saliva, and that these troubles were just as pronounced with flavoured cakes as with the pure cake. Prolonged soaking in water did not seem to effect any improvement. No difficulty was experienced in inducing cows to eat 6 lb. of the cake at a meal, but the time required for consumption was three or four times that required for the consumption of an equal quantity of linseed cake or soya cake. When the palm kernel cake was fed in admixture with other cakes or meals the difficulty disappeared provided the palm kernel cake did not form more than about one-third of the total mixture.

It is clear that the introduction of palm kernel cake as a new foodstuff into rations for cattle and sheep demands rather more patience and ingenuity on the part of the stockman than is required with most foods, but if the stock be made familiar with it from an early stage onwards it is quite possible that the difficulty may be largely reduced. It is indeed worthy of note that on the Continent where palm kernel cake and meal are most widely used little significance appears to be attached in practice to any difficulty of this character. It is earnestly to be desired, therefore, that not too much emphasis will be placed upon this apparent defect, but that the palm kernel foods may receive a fair and exhaustive trial at the hands of the British agriculturist.

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LITERATURE.

1. A. VOELCKER. *Journ. Royal Agric. Soc.*, Ser. II. vol. i. (1865), p. 176.
2. *Report of Committee on Edible and Oil-producing Nuts and Seeds.* Cd 8217. London, 1916.
Also *Minutes of Evidence* Cd. 8248.
3. C. CROWTHER et al. "A Summary of Investigations made in the University of Leeds"
Journ. Board Agric., xxiii, pp. 734-749 (November, 1916).
 - (a) *Palatability* (H. J. Hargraves), pp. 735-737.
 - (b) *Keeping Properties* (W. Godden), pp. 737-740.
 - (c) *Digestibility* (H. E. Woodman), pp. 740-742.
 - (d) *Influence upon Yield and Composition of Milk* (A. G. Ruston), pp. 742-746.
 - (e) *Influence upon Composition of Butter-Fat* (Miss H. Woodhouse), pp. 746-748.

- 4 E. WEININGER *Die Landwirtschaftliche Versuchstationen*, lxxii (1910), 113.
- 5 F. LEHMANN *Landwirtschaftliche Jahrbucher*, 1902, 161.
- 6 O. KELLNER *Die Ernährung der landwirtschaftlichen Nutztiere* Paul Paicy, Berlin
(A translation by Goodwin of an abridged edition of this work has been published by Duckworth & Co, under the title *The Scientific Feeding of Animals*)
- 7 E. POTT *Handbuch der tierischen Ernährung und der landwirtschaftlichen Futtermittel* 3 vols Paul Paicy, Berlin
8. J. HENDRICK AND W. J. PROPLIT *The North of Scotland College of Agriculture Bull* No 21 (1916).
- 9 C. CROWTHER *Journ Board Agric*, xxiii, 305 (July, 1916)
- 10 J. A. WYLIE *Wist of Scotland Agric College Bull* No 77 (1916)
11. C. CROWTHER *Journ Board Agric*, xxiii, 550 (December, 1916)

THE CORN AND MEAT TRADES SINCE THE WAR.

I.—THE CORN TRADE.

THE remarkable changes which have been induced by the war on the corn trade were set forth briefly in a special article in the Journal for last year (Vol. 76, p. 19). The essayist on that occasion is only too well aware how incomplete that study was, but the censor's blue pencil, while leaving all essential particulars, eliminated in many leading instances the reasons for and explanations of such information. In the present instance there are submitted the figures of the previous issue with all additions necessary to bring them down to date and with sundry additional information such as is not within the purview of the censorship, involving as it does no more than the due marshalling of facts already passed by the Press Bureau. That the particulars presented cannot be duly commented upon by the compiler is an effect not of neglect but of *force majeure*. Speaking generally it may be said that the essential trouble has been in not appreciating early enough the fact that food production within the empire was a necessary line of national defence.

TABLE I.—*Shipping Year, August 1—July 31.*

United Kingdom Wheat and Flour Imports (480 lb.).

	1915-16	1914-15	1913-14
EMPIRE :			
Canada	13,240,027	7,424,617	6,830,938
India	1,633,612	3,256,568	3,007,852
Australia	600,623	463,579	3,476,881
ABROAD :			
U.S.A.	10,505,611	12,350,795	8,870,977
Russia	140,256	168,611	2,246,673
Argentina	830,592	2,824,458	1,729,567
VARIOUS	68,069	163,953	869,090
TOTAL	27,018,790	26,652,581	27,031,978

The salient feature of the shipping year 1915-16 was the close correspondence of its supply total with that of its two predecessors. War exerted astonishingly little effect on the aggregate supply, nor had any one to think of short commons. The largely increased supply of Canadian wheat was the other leading feature.

TABLE II.—*Shipping Year, August 1—July 31.*

United Kingdom Imports.

	Barley (400 lb.)	Oats (312 lb.)	Maize (480 lb.)
1915-16	5,036,000	4,562,000	8,400,000
1914-15	4,010,000	5,753,000	11,420,000
1913-14	5,911,000	5,874,000	9,369,000

Principal sources of barley were, for 1915-16, the United States, Canada, and India. The loss of Russian supply, though severely felt, was not so great an influence as in the preceding year.

Principal sources of oats were, for 1915-16, the United States and Argentina with Canada. The New World failed in the case of this cereal to make up for the loss of the Russian supply.

Principal sources of maize were, for 1915-16, La Plata and the United States. The failure of the latter to export freely was the problem of the season, as the crop had been large.

TABLE III.—*Wheat and Flour Shipments to Europe (180 lb.).*

	1915 16	1914 15	1913 14
EMPIRE			
Canada	36,037,000	19,000,000	11,000,000
India	620,000	1,100,000	3,700,000
Australia	3,900,000	80,000	6,100,000
ABROAD			
U S A.	18,019,000	26,000,000	16,000,000
Russia	790,000	250,000	21,500,000
Argentina	6,200,000	9,500,000	3,300,000
VARIOUS	1,000,000	100,000	8,100,000
TOTAL	66,566,000	59,330,000	72,700,000

Large supplies of Canadian wheat in 1915-16 may be said to have saved the situation for the Allies. The failure of India to maintain the standard of 1914-15 shipments was a result in the main of tonnage difficulties. On the whole the breadstuffs shipments of the season were not insufficient and the war insurance did not exceed an average of 1 per cent. on the value. The great falling-off in the item "various" is due to Russia and Roumania ceasing to be represented.

TABLE IV.—*Barley Shipments to Europe (400 lb.).*

	1915-16	1914-15	1913 14	1912 13
EMPIRE				
Canada	1,150,000	50,000	40,000	60,000
India	1,200,000	310,000	500,000	1,950,000
Australia	—	10,000	10,000	6,000
ABROAD				
U S A.	3,100,000	3,100,000	2,100,000	3,100,000
Russia	10,000	750,000	21,000,000	17,000,000
Argentina	330,000	190,000	90,000	5,000
VARIOUS	1,250,000	150,000	3,000,000	2,150,000
TOTAL	7,070,000	4,590,000	29,740,000	24,270,000

A good effort was made in 1915-16 to improve upon the disastrous export standard of 1914-15, but the quantity shipped remained greatly below the needs of the importing countries. India was sadly hampered by the tonnage difficulty. The Canadian effort demands appreciation, and there is every hope of Canadian feeding barley becoming a feature in trade after the war. Quality barley the Dominion seems unable to

produce, and the maltster is admittedly at his wits' end for supply of 448 lb. barley.

TABLE V.—*Shipments of Oats to Europe (304 lb.).*

	1915-16	1914-15	1913-14	1912-13
EMPIRE :				
Canada	2,700,000	400,000	480,000	150,000
India	—	—	—	—
Australia	5,000	10,000	5,000	5,000
ABROAD :				
U.S.A.	9,500,000	10,200,000	1 100,000	4,100,000
Russia	—	10,000	3,900,000	5,600 000
Argentina	4,400,000	3,600,000	2,900,000	6,600 000
VARIOUS	600,000	100,000	1,050,000	100,000
TOTAL .	17,205,000	14,520,000	9,135,000	16,355,000

Shipments of oats, all things considered, were surprisingly good, but so fierce was the demand for France and Italy that the United Kingdom was gravely under-supplied. A good effort was made by Canada to help us. At present the scarcity of imported oats is a very grave difficulty.

TABLE VI.—*Maize Shipments to Europe (480 lb.).*

	1915-16	1914-15	1913-14	1912-13
EMPIRE :				
Canada . .	15,000	20,000	15,000	10,000
India . .	5,000	—	—	—
Australia .	—	—	—	—
ABROAD :				
U.S.A. . .	5,200,000	5,100,000	250,000	4,700,000
Russia . .	—	139,500	2,050,000	1,700,000
Argentina .	18,100,000	25,300,000	17,800,000	24,800,000
VARIOUS . .	1,000,000	405,000	1,600,000	800,000
TOTAL . .	24,620,000	30,961,500	24,715,000	32,010,000

The ravenous markets for barley and oats are sufficiently explained by the dearth of maize. The United States was credited with an export surplus of over thirty million quarters, or about ten times what was actually shipped. The American maize is said to have been devoted to feeding poultry and pigs, but exports of food in that form by no means upheld this view. The Argentine was known to be less than usual.

TABLE VII.—*Prices of Imported Produce, August 1—July 31 (Shipping Years).*

First market of month. 1. Best Canadian Wheat, per 480 lb. 2. Argentine Wheat, per 480 lb. 3. American Red Winter Wheat, per 100 lb. 4. Foreign Feeding Barley, per 400 lb. 5. Foreign Light Oats, per 304 lb. 6. Maize, per 480 lb. 7. Linseed, per 416 lb. 8. Feeding Rice, cleaned, per 112 lb. 9. Fine American Flour, per 280 lb. 10. Feeding Sugar, per 112 lb.

	1	2	3	4	5	6	7	8	9	10
I. SHIPPING YEAR 1914-15.										
1914										
August	45/-	42/-	9/-	27/-	21/-	31/-	54/-	9/-	31/-	10/-
September	50/-	—	9/1	30/-	29/-	33/-	54/-	12/-	39/-	20/-
October	47/9	—	8/8	27/-	27/-	27/-	48/-	12/-	37/-	20/-
November	49/6	—	9/-	29/-	29/-	31/-	45/-	11/9	38/6	18/-
December	50/-	—	9/5	30/-	28/-	29/-	46/-	11/9	38/-	15/-
1915										
January	54/-	52/-	10/4	30/-	29/-	29/-	46/-	12/-	40/-	15/-
February	64/-	68/-	13/6	37/-	34/-	37/-	56/-	12/-	49/-	15/-
March	67/-	67/-	13/8	36/-	32/-	38/-	52/-	11/-	49/-	17/-
April	68/-	65/-	13/2	35/-	31/-	35/-	50/-	12/-	48/-	16/-
May	71/-	67/-	14/-	35/-	31/-	40/-	52/-	11/9	50/-	19/-
June	70/-	68/-	13/6	35/-	29/-	36/-	55/-	11/9	50/-	20/-
July	58/-	53/-	11/9	36/-	27/-	32/-	54/-	12/-	46/-	20/-
II. SHIPPING YEAR 1915-16.										
August	60/-	57/-	11/6	39/-	27/-	32/-	54/-	12/-	45/-	20/-
September	60/-	56/-	11/4	41/-	26/-	32/-	55/-	13/-	43/-	22/-
October	62/-	56/-	10/3	37/-	27/-	32/-	54/-	14/-	42/-	25/-
November	60/-	58/-	11/2	40/-	32/-	38/-	59/-	14/-	43/-	29/-
December	61/-	59/-	11/8	39/-	31/-	41/-	65/-	11/6	45/-	30/-
1916										
January	67/-	63/-	12/8	41/-	33/-	47/-	75/-	15/6	48/-	31/-
February	72/-	66/-	15/-	44/-	33/-	50/-	80/-	16/-	51/-	31/-
March	72/-	70/-	15/-	46/-	32/-	53/-	78/-	16/6	50/-	30/-
April	66/-	64/-	13/-	43/-	28/-	46/-	73/-	16/-	47/-	30/-
May	63/-	62/-	12/-	45/-	35/-	53/-	71/-	15/6	48/-	30/-
June	56/-	57/-	10/-	41/-	30/-	44/-	69/-	17/-	43/-	30/-
July	52/-	52/-	9/9	41/-	30/-	44/-	69/-	17/-	43/-	30/-

Since July we take Java sugar (95 per cent. polarisation) as the standard. The failure of the Executive to establish an official standard of sound feeding sugar is, we think, to be deprecated, but may have been remedied before these words see the light.

The rise in wheat, December, 1915—March, 1916, was avowedly speculative, and was succeeded as is usual in such

cases by an equally excessive reaction. The remarkable prices realised on the Bull movement since August 1, 1916, are referred to in a note on the later movements of the markets. Since November 16, 1916, these violent oscillations have been effectively controlled by the Administration. The high price of imported feeding barley remained a constant feature of the entire shipping year, and was the more truly remarkable because the element of speculation was absent. Oats present somewhat similar features. America had a record—a colossal crop—but the quality was miserable. Much of what reached Mark Lane was 280 lbs. to 288 lbs. only in actual weight. The stocks even so must be very large, and the failure of the United States to ship oats to beyond ten million quarters standard is almost conceded to be due to tonnage difficulties. When tonnage is scarce quality produce finds the first outlet, and other articles took the *pus* of oats. Neither Canada nor the United States have sent us any oats weighing 336 lbs. to the quarter. Maize has had its ups and downs. The fortunate buyers were those who obtained cargoes from August to October, 1915, when the American new crop was ripening to a record harvest. When these cargoes arrived early in 1916 they commanded 15s. to 18s. above their purchase price. Linseed experienced an unusual winter rise and summer fall. Its subsequent advance to 100s. per quarter belongs to a later record, given in our concluding note. Rice remained throughout the shipping year at a reasonable quotation. The multitude of peasant proprietors in India, Burma, Cochin China, and China are non-speculative, and the question of supply has been simply one of tonnage. American flour has fluctuated in demand; nor can we regret that on the whole it has not grown in favour. Sugar has become so scarce that it has been required for human use almost exclusively, and for several months past has been out of use for feeding to live stock.

On the official figures for the harvest years it is not necessary to comment further than to say that they explain the material rise in the tithe average. If the clergy are ever prejudiced by the sale at statute markets of tailings and poultry wheat at a far lower price than that of milling corn, they get a decided advantage in periods when feeding barley and oats are retained on the farm, and nearly all the spring corn sent to the markets which “make the tithe” consists of quality samples. The great trouble of the local produce during the harvest year ended August 31 lay outside not only the scope of the present writer but of the *Journal of the Board of Agriculture* itself. This trouble related to getting the grain to market and delivered to the consumer, and the same railway

TABLE VIII.

(From the *Journal of the Board of Agriculture.*)

Harvest years Sept. 1—August 31	Prices per quarter					
	Wheat		Barley		Oats	
	s.	d.	s.	d.	s.	d.
1905—1906 (vol. xxii., No. 6, p. 581)	28	9	24	2	18	5
1906—1907 " "	28	1	24	5	18	4
1907—1908 " "	32	9	25	8	18	2
1908—1909 " "	36	6	26	11	18	10
1909—1910 " "	32	6	23	10	17	8
1910—1911 " "	30	11	24	9	17	8
1911—1912 " "	34	10	31	2	21	6
1912—1913 " "	32	0	27	10	19	7
1913—1914 " "	32	4	26	10	19	1
1914—1915 " "	49	9	32	6	28	8
1915—1916 (vol. xxiii., No. 6, p. 593)	53	0	49	0	30	11

TABLE IX.—*British Prices. First Market of each month.*

	Wheat, 480 lb. Average	Barley, 400 lb. Average	Oats, 312 lb. Average	Household flour, 280 lb. No. 1	Bread, 4 lb. house- hold
1914.					
August	34/2	25/9	19/8	32/-	5d.
September . . .	36/5	30/6	23/9	34/-	5½d.
October	37/1	29/1	22/9	34/9	6d.
November . . .	38/8	28/6	23/7	36/-	6½d.
December . . .	42/2	30/2	25/9	39/6	7d.
1915.					
January	44/4	29/10	26/6	46/6	8d.
February	53/3	32/5	29/10	49/3	8½d.
March	55/11	34/6	31/8	51/-	9d.
April	54/6	31/9	30/6	52/-	9d.
May	57/8	32/7	31/5	53/-	9d.
June	61/9	35/1	32/5	47/-	8½d.
July	49/5	35/3	31/1	43/-	8d.
August	55/1	35/7	31/5	44/-	8d.
September . . .	45/3	38/1	26/10	42/-	8d.
October	43/5	40/4	26/5	43/6	8d.
November . . .	51/6	47/3	30/4	44/-	8d.
December . . .	53/7	49/-	31/-	46/-	8½d.
1916.					
January	54/9	47/5	30/10	49/-	9d.
February	58/3	52/5	32/1	52/-	9½d.
March	59/4	55/7	32/4	52/-	9½d.
April	53/6	53/8	30/5	48/-	9d.
May	55/7	53/1	32/10	48/-	9d.
June	53/3	53/9	33/3	46/-	8½d.
July	46/3	49/1	30/10	41/-	8d.
August	55/1	46/1	32/9	47/-	8½d.
September . . .	59/4	48/5	30/5	54/-	9½d.
October	59/2	54/5	31/1	56/-	9½d.
November . . .	66/7	56/2	34/-	60/-	10d.
December . . .	71/3	63/1	41/4	59/-	10d.

difficulty much impeded the customary sale of barley and oats off the farm and compensatory "importation" of maize and other overseas products at a lesser price. After the petrol restriction orders the roadway delivery and receipt of feeding stuffs became as precarious as the business by rail.

The fluctuations in English wheat have been due to the influence of the supply of imported corn, and have followed in the train thereof mainly, being controlled by Canadian wheat. The steady rise in English barley and oats is due to shortness of market supply. Farmers have used much more than usual on the farm, the two main reasons being the scarcity of maize and the difficulties of securing delivery of other feeding stuffs. Bread and flour have been under Government control since December 1, and consequently wheat has advanced 1s. 8d. per quarter without bread being dearer. The 6 per cent. increase in the flour resulting from the Government insisting on a 78 per cent. long run in place of the wasteful 72 per cent. of peace time has made the wheat "go further" and has worked altogether well.

TABLE X.—*Breadstuffs. Supplies for the Harvest Years, September 1—August 31.*

	1917-18	1914-15	1913-14	1912-13
	Qrs. (480 lb.)	Qrs. (480 lb.)	Qrs. (450 lb.)	Qrs. (480 lb.)
British	7,324,000	7,801,000	7,087,100	7,175,300
Imported	26,591,000	26,013,160	26,921,220	30,149,150
Total	33,915,000	33,817,160	34,008,320	37,324,750
Wants.	34,000,000	33,600,000	33,200,000	32,800,000
	- 85,000	+ 217,160	+ 808,320	+ 4,524,750

The strain of the war has increased, but the needs of the cereal year in the way of breadstuffs were in effect met. If the home crop deliveries had equalled those of the preceding year there would have been quite a comfortable surplus. It is a matter of no little regret that the requisite effort was not made. We actually obtained, despite the submarines and the tonnage difficulty, 577,840 quarters more wheat from abroad than in 1914-15. These figures appear to indicate that an increase of 250,000 acres in the home wheat area would cause the greatest possible relief and ease the wheat commission materially in its task of balancing supply and demand.

TABLE XI.—*Feeding Stuffs Imports. Harvest Years, September 1—August 31.*

	1915-16	1914-15	1913-14	1912-13
	Qrs.	Qrs	Qrs	Qrs
Maize (480 lb)	8,497,760	11,197,760	9,375,869	11,557,161
Bailey (400 lb)	4,764,900	3,512,152	5,923,664	6,239,878
Oats (304 lb)	4,814,880	5,654,563	5,665,811	7,373,639

The Canadian, United States, and Argentine barley shippers made a special effort and sent us $1\frac{1}{2}$ million quarters more barley than in 1914-15. Unfortunately India and North Africa both disappointed us, the first from want of tonnage, the second because of a 25 per cent. deficiency in the crop. The supply of oats has been inadequate, the French and Italian purchasers steadily outbidding Great Britain on the New World markets. Of maize America, out of a record yield, has shipped in an extraordinarily niggardly manner. This is the one cause of the small total.

TABLE XII.

Stocks of Breadstuffs, September 1, United Kingdom.

1916	.	2,005,000	quarters at 59/-
1915	.	2,090,000	, 52/-
1914	.	2,100,000	„ 36/2
1913	.	2,450,000	„ 32/7

TABLE XIII.

Stocks of Wheat, September 1, United States.

1916	.	11,000,000	quarters at 55/-
1915	.	1,785,000	, 38/10
1914	.	6,155,000	, 41/-
1913	.	7,090,000	„ 32/6

TABLE XIV.—*Wheat Production. The World's Balance Sheet, September 1, 1916.*

	Production	Wants	Surplus	Deficiency
	Qrs (480 lb)	Qrs. (480 lb)	Qrs (480 lb)	Qrs (480 lb)
The U.K.	7,250,000	34,000,000	—	26,750,000
The U.S.	86,000,000	80,000,000	6,000,000	—
France	28,250,000	43,000,000	—	14,750,000
Italy	25,000,000	29,000,000	—	1,000,000
Peninsula	19,500,000	19,000,000	500,000	—
Russia	105,000,000	70,000,000	35,000,000	—
Roumania	12,800,000	8,000,000	4,800,000	—
Canada	20,000,000	8,000,000	12,000,000	—
India	40,000,000	36,000,000	4,000,000	—

Indian wants for 1914-15 appear to have been over-estimated; as a yield of 40 millions has left fully 4,000,000 quarters reserves, 36 millions cannot be exceeded as requirements.

TABLE XV.—*Wheat Production. Millions of Qrs. (480 lb.). Ten Years.*

	1916	1915	1914	1913	1912	1911	1910	1909	1903	1907
The U.K. .	7.2	9.5	7.8	7.1	6.0	8.0	7.2	7.9	6.8	7.3
The U.S. .	86.0	124.0	111.4	95.4	91.0	78.0	79.4	92.0	82.4	79.0
France .	28.2	30.0	39.2	40.0	41.9	40.3	31.5	45.0	39.0	47.0
Italy .	25.0	24.0	21.0	26.1	20.8	24.0	19.0	23.0	24.0	22.6
Peninsula .	19.5	18.0	15.5	15.0	14.5	19.0	18.0	18.0	14.6	14.0
Russia .	105.0	111.0	101.0	120.0	91.0	68.0	103.0	98.0	71.0	64.0
Roumania .	12.8	13.6	6.0	10.0	11.0	12.5	13.4	6.9	6.7	5.3
Canada .	20.0	34.0	20.0	30.0	28.0	27.0	19.0	21.0	14.0	10.5
India .	10.0	48.0	40.0	15.0	46.0	46.5	44.0	35.0	27.0	40.0

TABLE XVI.

World Production of Feeding Stuffs. Millions of Cwts. (112 lb.). Ten Years' Average, 1905—1914 inclusive.

	Barley	Oats	Maize
United Kingdom .	29.0	60.0	<i>Nil</i>
U.S. .	71.0	300.0	1,378.0
France .	20.0	100.0	11.4
Italy .	4.0	10.0	50.0
Peninsula .	12.0	8.0	14.0
Russia .	200.0	286.0	42.0
Roumania .	11.0	7.5	51.0
Canada .	20.0	94.0	9.0
India .	40.0	<i>Nil</i>	20.0

For 1916 the barley yields of the United Kingdom, France, the United States, Canada and Italy were deficient, but the Peninsula had a record crop, Russia, Roumania and India average yields.

In 1916 the yields of oats were fair for the United Kingdom, France and Russia, but small for the New World countries and for Italy. Roumania had a short crop.

Maize in 1916 yielded below an average in all the chief producing countries, but the United States have still large reserves of the colossal 1915 yield.

TABLE XVII.—*Wheat Shipments for 1916.*
(Unit 1,000 quarters of 480 lb.)

1916	North America	South America	India	Australia
January .	5,493	231	5	780
February .	4,150	1,142	—	612
March .	4,349	1,431	—	624
April .	4,421	1,536	27	921
May .	3,721	1,101	45	874
June .	4,096	878	151	606
July .	4,600	1,048	220	506
August .	3,010	301	398	453
September .	4,080	399	565	581
October .	3,440	783	774	577
November .	2,407	410	339	376
December .	3,113	940	535	365
Totals for seven years.				
1916 .	46,880	10,200	3,062	7,275
1915 .	33,578	11,120	4,274	180
1914 .	29,757	4,237	3,016	6,663
1913 .	23,675	13,233	6,116	4,935
1912 .	16,638	12,539	7,874	1,992
1911 .	9,675	10,925	5,962	7,792
1910 .	8,253	8,246	5,061	6,490

TABLE XVIII.—*Shipments of Feeding Stuffs for 1916.*
Unit 1,000 quarters (Maize 480 lb., Barley 400 lb., Oats 312 lb. per quarter).

1916	North America			South America		
	Maize	Barley	Oats	Maize	Barley	Oats
January .	281	583	841	1,316	—	418
February .	542	342	815	613	—	392
March .	364	339	961	381	—	888
April .	474	315	1,501	415	—	421
May .	418	250	1,333	665	—	162
June .	474	284	1,486	675	8	631
July .	437	469	1,873	1,349	16	716
August .	626	353	1,523	1,419	21	819
September .	647	315	1,300	1,691	48	690
October .	435	335	933	1,902	50	511
November .	295	271	534	1,630	111	212
December .	166	181	1,034	1,151	64	119
Totals for seven years.						
1916 .	5,159	4,067	11,181	13,273	294	6,339
1915 .	4,103	2,339	11,609	20,230	264	4,786
1914 .	724	2,182	4,863	15,623	135	2,988
1913 .	5,351	3,143	2,037	22,204	80	6,184
1912 .	2,596	895	3,768	21,800	25	6,955
1911 .	6,174	682	892	480	—	4,586
1910 .	3,619	1,179	519	11,743	—	2,815

India, in 1916, shipped 597,000 quarters of barley.

We are in a position to present in Table XIX. figures not previously available with respect to grain stocks within the United Kingdom. They reveal a fairly successful struggle against importation difficulties, but they all also disclose the serious need for increased production within the Four Seas.

TABLE XIX.—*Stocks of Grain in the United Kingdom.*
(Unit 1,000 quarters)

	Wheat		Barley		Oats		Maize	
	London	U.K.	London	U.K.	London	U.K.	London	U.K.
Jan 1, 1917	54	1,619	39	330	395	826	34	705
" 1916	59	860	18	300	333	590	80	895
" 1915	186	1,700	118	380	291	525	59	615
" 1914	28	1,516	135	800	360	600	150	1,539
" 1913	151	1,603	126	610	100	610	49	619

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II.—THE IMPORTED MEAT TRADE.

The year 1916 was occupied by importers and retailers in adapting themselves to the altered conditions of the trade under Government control. The purchase by the Board of Trade of the entire Australasian output of beef, mutton and lamb, as well as the bulk of the River Plate beef shipments (chiefly for Army requirements) resulted in wholly inadequate supplies of imported meat being available for the civilian trade. Home supplies were more plentiful than usual, and mitigated, to some extent, the effects of the shrinkage in imports; nevertheless, with a continuously insistent demand, and a frequently insufficient supply, prices generally throughout the year ruled at a very high level.

Practically all the Australian and New Zealand lamb purchased f.o.b. by the Government, being unsuitable for Army purposes, was released for sale through the usual trade channels, at prices controlled by representatives of the Board of Trade. Small quantities of mutton (mostly old ewes) were also placed

on the market. These supplies were eagerly sought after by buyers, on account of their cheapness as compared with South American descriptions, which, unhampered by Government ownership, were frequently quoted at 2*d.* and 3*d.* per lb. above the intrinsically superior New Zealand article.

Freight continued to be very scarce, notwithstanding the existence of refrigerating steamers capable of carrying nearly double the quantity of meat transported last year; but Army transport requirements, and other circumstances, prevented anything like the full powers of these steamers being utilised for importing meat.

The disastrous drought in Australia was responsible for a reduction amounting to 70/80,000 tons in much-needed Empire supplies in 1916. Happily the latter part of the year was favoured by splendid rains throughout the Commonwealth, and the situation is now more favourable than it has been for many seasons.

The following Tables bring out the salient statistics of the trade :—

TABLE I.—*Imports of Frozen and Chilled Beef into the United Kingdom.*

Source	1916	1915	1914
EMPIRE—	Tons	Tons	Tons
Australia	38,275	61,847	77,550
New Zealand	43,754	36,761	23,834
Canada	6,370	3,594	—
South Africa	1,943	2,324	56
Total Empire . . .	90,342	104,526	101,440
FOREIGN—			
Argentina	201,884	254,823	299,656
Uruguay	10,305	14,181	36,489
United States	46,511	50,067	4,380
Other Countries	3,766	2,332	—
Total Foreign . . .	262,466	325,403	340,525
TOTAL IMPORTED . .	352,808	429,979	441,965

The total imports of beef for 1916 show a reduction of 18 per cent. as compared with 1915, and 20 per cent. as compared with 1914, the chief reason being that large quantities were diverted to the Continent for the armies of the Allies.

TABLE II.—*Imports of Frozen Mutton and Lamb into the United Kingdom.*

Source	1916	1915	1914
EMPIRE—	Tons	Tons	Tons
Australia . . .	13,063	62,725	66,803
New Zealand . . .	114,369	121,140	118,316
Total Empire . . .	127,437	183,865	185,169
FOREIGN—			
Argentina . . .	38,113	39,087	57,279
Uruguay . . .	1,012	1,955	1,758
Patagonia . . .	11,986	7,563	8,256
Other Countries . . .	2,125	176	—
Total Foreign . . .	53,566	49,081	67,293
TOTAL IMPORTED . . .	181,003	232,946	252,462

There was a heavy decrease in Empire supplies in 1916, while foreign shipments were well maintained.

RECAPITULATION.

TABLE III.—*Imports of Frozen and Chilled Beef, Mutton and Lamb into the United Kingdom.*

Source	1916	1915	1914
EMPIRE —	Tons	Tons	Tons
Australia . . .	51,313	124,572	143,853
New Zealand . . .	158,123	167,901	112,700
Canada . . .	6,370	3,594	—
South Africa . . .	1,913	2,324	56
Total Empire . . .	217,779	298,391	256,609
FOREIGN—			
Argentina . . .	240,297	293,910	356,935
Uruguay . . .	11,347	20,136	38,247
Patagonia . . .	11,986	7,863	8,256
United States . . .	48,628	50,067	4,380
Other Countries . . .	3,774	2,558	—
Total Foreign . . .	316,032	371,534	407,818
TOTAL IMPORTED . . .	533,811	669,925	664,427

The Australian decrease is partly due to the drought, and partly to the diversion of some 50,000 tons to the Continent in 1916. New Zealand appears to be responding well to the call for Empire supplies. The decrease in arrivals of all kinds of imported meats in 1916 represented about 20 per cent. of the 1915 total, and 23 per cent. of the 1914 total.

TABLE IV.—*World's Output of Frozen and Chilled Beef, Mutton and Lamb.*

Source	1916	1915	1914
EMPIRE—	Tons	Tons	Tons
Australia	104,033	132,090	171,200
New Zealand	158,123	137,988	146,505
Canada	21,723	6,278	—
South Africa	7,928	2,324	56
Total Empire	291,827	298,680	317,761
FOREIGN—			
Argentina	436,405	451,952	469,978
Uruguay	43,895		
Patagonia (Chill)	11,986	7,863	8,256
Brazil	33,571	4,899	—
United States	80,255	102,613	4,380
Other Countries	17,141	12,068	—
Total Foreign	623,553	582,395	482,614
TOTAL PRODUCTION . .	915,380	881,075	800,375

The above figures reveal a steady decline in Empire supplies, accompanied by a rapid rise in foreign production, during the past three years. The Canadian and South African trades were created by the war, and have yet to prove their ability to survive a return to more normal prices. The foreign "war trades" are those from Brazil and United States, the former of which promises to become important, while the latter already shows signs of falling off. The total quantity of frozen and chilled meat produced in the world in 1916 was the greatest on record.

TABLE V.—*Distribution of World's Output of Frozen and Chilled Beef, Mutton and Lamb.*

Destination	1916	1915	1914
	Tons	Tons	Tons
United Kingdom	533,811	662,925	694,427
Continental, Mediterranean, } Eastern, and other Markets }	365,648	173,854	34,852
United States	15,921	44,296	71,096
TOTAL	915,380	881,075	800,375

This table shows the general trend of the Refrigerated Meat Trade away from the United Kingdom. Whereas, in 1914, 87 per cent. of the frozen and chilled meat produced came to the United Kingdom—in 1916, only 58 per cent. arrived in this country.

TABLE VI.—*Top Wholesale Quotations at Smithfield Market for the leading descriptions of Frozen and Chilled Beef, Mutton and Lamb on the first Friday of every month, 1916.*

1. New Zealand Mutton. 2. Australian Mutton. 3. Argentine Mutton. 4. New Zealand Lamb. 5. Australian Lamb. 6. Argentine Lamb. 7. Argentine Chilled Beef Hindquarters. 8. Argentine Chilled Beef Forequarters. 9. New Zealand Cow Beef Hindquarters. 10. New Zealand Cow Forequarters.

Month	PRICES PER LB									
	1	2	3	4	5	6	7	8	9	10
January	7 ³ / ₈	—	7 ¹ / ₂	7 ¹ / ₂	—	—	9 ¹ / ₂	6 ¹ / ₂	6 ¹ / ₂	5 ¹ / ₂
February	7 ³ / ₈	7 ¹ / ₂	7 ¹ / ₂	7 ¹ / ₂	7 ¹ / ₂	—	7 ¹ / ₂	6 ¹ / ₂	6 ¹ / ₂	5 ¹ / ₂
March	7 ³ / ₈	7 ¹ / ₂	8 ¹ / ₂	8 ¹ / ₂	5 ¹ / ₂	—	5 ¹ / ₂	6 ¹ / ₂	6 ¹ / ₂	5 ¹ / ₂
April	7 ³ / ₈	7 ¹ / ₂	10 ¹ / ₂	8 ¹ / ₂	8 ¹ / ₂	10 ¹ / ₂	5 ¹ / ₂	7 ¹ / ₂	7 ¹ / ₂	6 ¹ / ₂
May	7 ³ / ₈	7 ¹ / ₂	9 ¹ / ₂	8 ¹ / ₂	8 ¹ / ₂	9 ¹ / ₂	10 ¹ / ₂	5 ¹ / ₂	9 ¹ / ₂	7 ¹ / ₂
June	4 ³ / ₈	5 ¹ / ₂	10 ¹ / ₂	9 ¹ / ₂	9 ¹ / ₂	1/0 ¹ / ₂	1/-	10 ¹ / ₂	9 ¹ / ₂	8 ¹ / ₂
July	8 ³ / ₈	8 ¹ / ₂	9 ¹ / ₂	9 ¹ / ₂	9 ¹ / ₂	11 ¹ / ₂	8 ¹ / ₂	7 ¹ / ₂	7 ¹ / ₂	6 ¹ / ₂
August	8 ³ / ₈	9 ¹ / ₂	9 ¹ / ₂	9 ¹ / ₂	9 ¹ / ₂	11 ¹ / ₂	1/-	8 ¹ / ₂	6 ¹ / ₂	5 ¹ / ₂
September	8 ³ / ₈	8 ¹ / ₂	9 ¹ / ₂	9 ¹ / ₂	9 ¹ / ₂	11 ¹ / ₂	9 ¹ / ₂	7 ¹ / ₂	6 ¹ / ₂	5 ¹ / ₂
October	8 ³ / ₈	8 ¹ / ₂	8 ¹ / ₂	9 ¹ / ₂	—	9 ¹ / ₂	9 ¹ / ₂	7 ¹ / ₂	7 ¹ / ₂	6 ¹ / ₂
November	8 ³ / ₈	—	6 ³ / ₈	9 ¹ / ₂	—	9 ¹ / ₂	8 ³ / ₈	7 ¹ / ₂	6 ¹ / ₂	6 ¹ / ₂
December	8 ³ / ₈	—	8 ³ / ₈	9 ¹ / ₂	—	9 ¹ / ₂	9 ¹ / ₂	5 ¹ / ₂	7 ¹ / ₂	6 ¹ / ₂

The firmer tone in the market at the close of 1915 developed into a rapid advance in prices, which reached its culminating point at the beginning of June. This was followed by a heavy slump during the summer months, when supplies of home-grown and imported meats became more plentiful,

values continuing at a moderate level during the last quarter, with an upward tendency at the close. In the month of June, the prices recorded for the various descriptions of imported meat broke all previous records in the history of the trade, *e.g.*, New Zealand mutton touched $8\frac{1}{2}d.$; Australian, $8\frac{1}{2}d.$; New Zealand and Australian lamb, $9\frac{1}{2}d.$; Argentine chilled beef hinds, $1/-$, fores, $10\frac{1}{2}d.$; Argentine mutton, $10\frac{1}{2}d.$; and Argentine lamb, $1/0\frac{1}{2}d.$ per lb.

TABLE VII.—*Top Quotations for the leading descriptions of Frozen Meat, as recorded during the past four years, average out as follows, viz.:*—

	AUSTRALIA				NEW ZEALAND				ARGENTINA			
	1913	1914	1915	1916	1913	1914	1915	1916	1913	1914	1915	1916
Mutton per lb	d. $\frac{4}{8}$	d. $4\frac{1}{2}$	d. $5\frac{1}{8}$	d. $7\frac{1}{8}$	d. $4\frac{1}{8}$	d. $5\frac{1}{2}$	d. $6\frac{1}{8}$	d. $8\frac{1}{8}$	d. $4\frac{1}{8}$	d. $4\frac{1}{8}$	d. $6\frac{1}{8}$	d. 9
Lamb „	5.	6	$7\frac{1}{8}$	9	$6\frac{1}{8}$	$6\frac{1}{2}$	$7\frac{1}{8}$	$9\frac{1}{8}$	$5\frac{1}{8}$	6	$7\frac{1}{8}$	$9\frac{1}{8}$
Beef (Fores) „	$3\frac{1}{8}$	$1\frac{1}{2}$	$6\frac{1}{2}$	—	$3\frac{1}{2}$	$4\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$	$6\frac{1}{8}$	—
Beef (Hinds) „	4	$5\frac{1}{2}$	7	—	4	$5\frac{1}{8}$	$7\frac{1}{8}$	$7\frac{1}{2}$	4	$5\frac{1}{8}$	$7\frac{1}{8}$	—

¹ Cow beef

The average increase last year was about 25 per cent., and this corresponds very closely with the increase registered in wholesale prices of home-grown meat, notwithstanding the fact that imported meats were in short supply while home-grown meats were plentiful.

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SOME MINOR FARM CROPS. IV.

MAIZE AS A FODDER CROP.

IN districts that are apt to suffer from drought in late summer, maize is always useful as an insurance crop; in the case of those who grow milk under circumstances that may be described as suburban farming, it is nearly always useful to have a small acreage of this bulky succulent "grass" (for such it is botanically) to cut between mid-August and October; but where you find these two sets of circumstances combined, its value is hard to overestimate. It has been the writer's lot to farm under these

combined circumstances for the last seven years, so that the art of maize growing has become to him an important item of the year's work.

SOILS.

Like every other farm crop, a rich deep loam is suitable, and its possession solves for the farmer seventy-five per cent. of the difficulties of getting a heavy yield. Unfortunately, these perfect soils are not common, and the crop happens to be particularly valuable on two inferior and widely different classes of land, *i.e.*, light burning soils of all descriptions, and cold, tenacious clays or "mixed" soils. No one who has worked these mixed soils—as they are often called—will question their tenacity, or doubt their frigidity, even if they are not strictly similar to "clays" in texture.

It may at once be said that, valuable as the heavy crop of maize is on either light or cold and heavy land, the trouble and care required to secure it is equally great.

PREPARATION OF THE LAND.

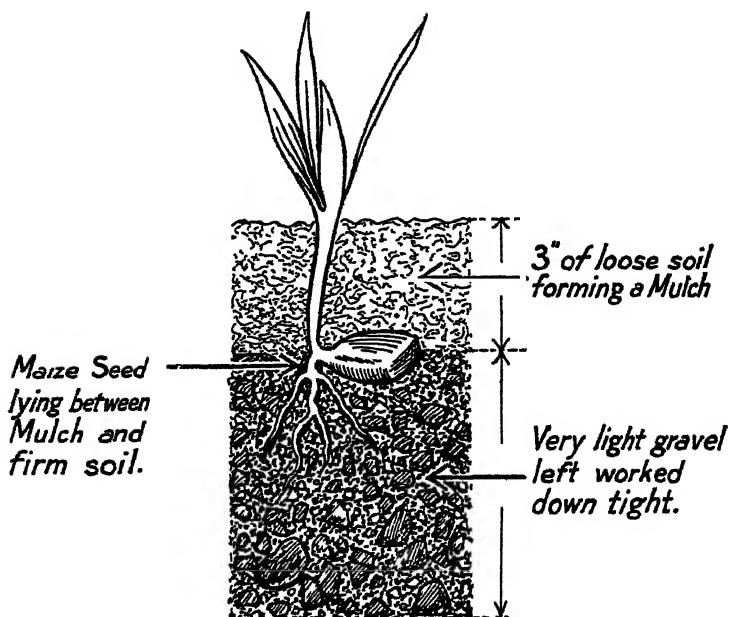
The two classes of soil mentioned above will at once indicate the necessity of two systems of tillage, but before treating of them, I would like to suggest to cow-keeping farmers a third, which may be of use to them.

It is generally possible to select a small field or piece of land near at home that can be specially "done" for cow-keep. Its proximity to the homestead not only allows of its being liberally supplied with dung, but also gives facilities for green-soiling. Land so liberally treated, as all such fields should be that have been carrying cabbage till Christmas or later, or rye or even winter oats for early green-soiling, or possibly growing vetches sown early the previous autumn, can very quickly be got into tilth for maize; and if a little suitable concentrated fertiliser is given, will grow bumper crops. Such small, specially treated pieces of land are, however, wanted for several "cow-keep" crops; summer cabbage, mangel, kohl rabi, and spring vetches, besides those already named. So that the area that can be allotted to maize is likely to be small, and one has often to rely on the out-field for the main supply of the crop, and will consequently have to face the difficulties of texture. These difficulties may be said to be overcome for one by the copious doses of farmyard manure which the "pet" bit of land we have just been talking about receives.

On heavy land good deep tilth is necessary. It is not at all unsuitable to set aside part of the mangel breadth. This gets a thorough working, but the maize piece does not require a very fine seed-bed. The after-winter working, given by any spring-tined cultivator of the Massey-Harris type, may be left untouched

from say, mid-April or early May, till the seed is about to be sown. Then a good working with heavy seed-harrows will be all that is required. Tilth-getting must, on these soils, be helped by ploughing under, early, a heavy coating of dung, wanted also for the subsequent feeding of the maize crop.

The seed wants to lie in crumb, but a very fine surface is decidedly objectionable. If, after sowing, the surface runs together, it should be broken down with the rim-roll, the light harrow, or even both these implements. For the plantlet is not strong at breaking through what is often called a surface-pan.



On very light land the case is quite different ; and on such soils the maize crop may with skill be made such as absolutely to avert ruin.

It is best to take the crop after sheepling, either a main or a catch crop. But at any cost the land must be firm. Late ploughing is much worse than no ploughing at all ; by ploughing I refer to any work that is found to turn over more than three inches of the surface. If a late dressing of dung has to be applied, it should go on the surface after seeding.

The Cambridge University Farm is named "Gravel Hill." The crops of maize on the poor burning "gravel-cap" that gives

it that name have been admired by hundreds of agriculturists from all over the world. May I, the Farm Director, be allowed to pay my tribute to the skill with which my managing bailiff (Mr. A. J. Burgess) gets those crops. For no attention to manuring, or seed, or anything else would be of any use in a droughty year were the land not properly worked.

The illustration on page 80 explains the conditions which are always aimed at. After our ewes and lambs have fed off their winter "sheep-keep," or a catch crop, or even after the land has lain all the winter unmoved, we cut off about three inches of the surface, and thoroughly work it about. We cut off with an old-fashioned "Broad-share," but it may be done by a plough, if the man can keep an even depth *and yet keep shallow*, or any suitable implement may be used. We always knock the soil which is cut off about with "handled-harrows," and then ordinary sets of seed harrows; introducing, if the sheeping has made the tilth lumpy or harsh, the roller as required. Any skilful worker of the land will get his deep surface mulch in his own way. "There are more roads than one leading to London."

If the "sheeping" has not been thorough enough properly to enrich the land—for maize is a gross feeder—we apply dung as a top-dressing in due course.

SEED.

In 1902-1903 the writer did some work, in search of suitable varieties, for the Wye College of Agriculture. Just as it looked as if some useful work had been begun, the Development Commissioners' funds then not being available, the search had to be discontinued. A dozen years of looking on enables me to say with confidence that that work *ought to be taken up again* by the Agricultural Botanist.

As things are I can only recommend a grower to secure any American "horse-tooth" variety *that will pass a searching germination test*; this is important, as the corn heats quickly on board ship, and is thus very easily spoilt. A great many seed merchants supply an excellent sample.

South African seed only was available in 1916. It was so trying a season that it is impossible to report upon it with confidence. So many failures were attributed to its use, possibly quite erroneously, that it must be subjected to many careful trials if it is not to be condemned altogether.

TIME AND METHOD OF SOWING.

One golden rule must be observed. *Do not attempt seeding until the soil is warm.* This will seldom be till the middle of May, and often not till the second week in June.

On light land, three to three and a half inches is the depth necessary, and must be obtained if a full yield is to be hoped for. On heavy land this is much too deep; one and a half to two inches is quite enough covering. The amount of seed must vary from two to three bushels according to soil and "heart" in the land.

Two feet should be allowed between the rows (for it should always be drilled) and the crop should not be set out, but left as thick as it will grow.

VERMIN.

No crop is more pestered by rooks, and all trouble will be well repaid that is spent in keeping it from them. Persistent and thorough bird scaring is the only safe method. High stringing with binder twine is a certain safeguard; surface-stringing is of little use. Tar, or some "proprietary" dressing composed chiefly of tar, seems to keep the birds away, but I have grave doubts as to the effect of tar on the germinating power of the seed.

Happily, if even a decent plant is once secured, a subsequent seeding, either with the drill or with the dibble, will soon catch up, and does not get punished by these pests. But once again I would urge that the best thing is to keep off the birds by efficient scaring. It is troublesome and costly, but pays in the end.

INTER-TILLAGE.

Both for the sake of the future crop and the future cleanliness of the land, the horse and even hand-hoeing cannot be overdone. I have, however, to thank my friend Mr. A. Howard, Imperial Economic Botanist to the Government of India, for teaching me the value of *moulding-up* maize. This simple operation demands preliminary deep stirring. It, however, kills many weeds growing between the plants in the rows, and very obviously increases the yield. It should be done when the maize is about two inches high. Moulding or "earthing-up" has a further advantage I will allude to later on.

MANURING.

This crop must be well done. A heavy "sheeping" or coating of manure must be supplemented with the equivalent of 3 cwt. of superphosphate. Further, if the crop *hangs* when it is about twelve inches high it must receive 1 cwt. of nitrate of soda on light land or, on heavy land, $\frac{1}{2}$ cwt. of a mixture of equal parts of "nitrate" and sulphate of ammonia

YIELD.

No grower should be pleased with himself if he does not obtain twenty tons to the acre on light land in a year of

drought. For the beauty of the crop is that once you have got it well started, it grows on without any further rainfall worth mentioning. On heavy soils in a good growing year, thirty tons is nothing to boast about. It is rare to find anyone who stops growing maize who had mastered its cultivation by the year 1911!

ITS USES.

In a year of drought it can be cut green and fed to any stock on the farm. In years of heavy rainfall it is apt to be thrown on the dung heap. This is altogether unnecessary waste. For some years I have found by proper methods that maize-hay may be made and turned to good use. The practice is to cut it with a scythe, and tie it into bundles with binder-twine. If the crop is very green or succulent, small bundles about six inches in diameter are big enough; if on the other hand the crop is anything like ripe (for in this country even, it sometimes sets a small "cob"), larger bundles are less costly to handle.

It is after cutting and tying that *the full advantage of moulding up* comes in. For across the ridges the bundles, or sheaves, will lie and dry stiff. If they are thrown on to flat ground and the weather gets bad, the crop must be turned over, or the bundles get very mouldy and even slimy on the under side. Once stiff enough to stand up the treatment of the hay is peculiar.

It will not stand stacking. In North America it goes into "barns," but in our trials, under this system as well as when stacked, the hay goes bad, becoming sour and slimy at the bands.

We now always stand it in huge "shocks" in the field. To form these some sort of foundation is wanted. Two old sheep hurdles may be set up, one inclined to the other tent-fashion. Or again we use an old sheep field-rack, or have the sheaves set up against the side of a hay rick in clusters of bundles numbering up to fifty.

This maize hay is fed from the shock till Christmas to any cattle old enough to be in the fields. The dry papery leaves and a short length of the thick part of the stem is not eaten; all the rest is cleared up with apparent relish, and saves cutting into the hay stacks till after Christmas.

In the winter of 1915-16 a lot of bundles were stood up under cover of the "lean-to" round the permanent lambing pen which exists on the University Farm. The sheaves were laid five or six deep against the wall of the shedding. The hay so made was eaten by the ewes at lambing time with such gusto as to satisfy our shepherd—quite as fastidious a man as any really good specialist of his class ought to be!

The dried maize has a further use in our suburban farming : *it makes an admirable covering for the mangel clamps.* We found a twenty-ton crop treated as above saved the use of three tons of straw for this purpose.

I have entered at some length into this part of the subject as the wastage of maize fodder in a growing year has been urged in the past as a grave disadvantage in its cultivation.

I am inclined to think a neighbour milk-farmer's practice is now even better than our own. He simply lets the crop stand, cuts it as it is wanted, and chaffs the whole plant for his cows. In the first week of December of this truly terrible autumn, the stuff he bought from us, and left standing on our farm, was really wonderful feed, the inner stalks were succulent, and very sweet to the taste ; the outer leaves were somewhat mouldy it was true, but all was "with something to help it" eaten up "clean and well."

ENSILAGE.

So far in this country maize has been a failure in the silo. In North America on the other hand it has been found particularly valuable for this purpose. I have been informed over and over again by our over-seas colleagues that for ensilage the crop we grow in this country does not get ripe enough to make the right stuff. Surely it is worth while spending time and money in search of varieties that will be useful in this respect.

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CONTEMPORARY AGRICULTURAL LAW.

I.—LEGISLATION.

THERE has not been much legislation in the past year directly affecting agriculture, but some Acts of Parliament should be noticed here as being indirectly of interest.

The Increase of Rent and Mortgage Interest (War Restrictions) Act, 1915 (5 and 6 Geo. 5, c. 97), should not be left out of sight in respect of the letting of cottages for agricultural labourers. By Section 1 Sub-section 1 it makes any increase of rent of a dwelling house to which the Act applies beyond the "standard rent" as thereafter defined irrecoverable, with a proviso that where the landlord has since the commencement of the present war incurred, or during the continuance of the Act incurs, expenditure on the improvement or structural

alteration of a dwelling house an increase of rent at a rate not exceeding 6 per cent. per annum on the amount so expended shall not be deemed to be an increase for the purposes of the Act. Sub-section 2 of Section 1 provides that no requirement of any fine, premium, or other like sum in addition to the rent in consideration of the grant, renewal or continuance of a tenancy of any dwelling house to which the Act applies shall be made, and if made after November 25, 1915, shall be recoverable by the tenant from the landlord. Sub-section 3 of the same Section provides that no order for the recovery of possession of a dwelling house to which the Act applies or for the ejectment of a tenant therefrom shall be made so long as the tenant continues to pay rent at the agreed rent as modified by the Act and performs the other conditions of the tenancy except on the ground that the tenant has committed waste or has been guilty of conduct which is a nuisance or an annoyance to adjoining or neighbouring occupiers, or that the premises are reasonably required by the landlord for the occupation of himself or some other person in his employ or in the employ of some tenant from him or on some other ground which may be deemed satisfactory by the Court making the order. The expression "standard rent" is by Section 2 defined as the rent at which the dwelling house was let on August 3, 1914, or where the dwelling house was not let at that date the rent at which it was last let before that date. By Sub-section 2 of Section 2 the Act is to apply to a house or part of a house let as a separate dwelling where such letting does not include any land other than the site of the dwelling house and a garden or other premises within the curtilage of the dwelling house and where either the annual amount of the standard rent or the rateable value of the house or part of the house does not exceed in the case of a house situate in the metropolitan police district 35/., in the case of a house situate in Scotland 30/., and in the case of a house situate elsewhere 26/.

In a case where notwithstanding this Act the rent had been raised by the landlord and the increase paid for some period by the tenant without any question, the tenant was held disentitled to deduct from subsequent rent payable by him the amounts which he had paid to the landlord on previous occasions in excess of the former rent of the house before it had been improperly increased. (*See Sharp Brothers and Knight v. Chant*, 52 Law Journal N.C., 97.)

This Act having been found to work hardly in certain cases and contrary to the interests of tenants (see *Bute (Marquis) v. Rees* (85 L.J.Ch. 421; [1916] 2 Ch. 64) the Courts (Emergency Powers) No. 2 Act, 1916 (6 and 7

Geo. 5, c. 18) has provided by Section 2 that a County Court may authorise the grant of a new lease for a term of twenty-one years or upwards of a dwelling house to which the Increase of Rent and Mortgage Interest (War Restrictions) Act, 1916, applies in consideration for which a fine, premium, or other like sum in addition to the rent is required, if the Court is satisfied that the terms of the tenancy are on the whole not less favourable to the tenant than the terms on which the dwelling house was previously let.

The Finance Act, 1916 (6 and 7 Geo. 5, c. 24), Section 38 amends the law with respect to income tax on woodlands as laid down in the Finance (No. 2) Act, 1915, Section 22 (see article on "Contemporary Agricultural Law," in Vol. 76 of this Journal, page 141), by providing that a person occupying woodlands who elects to be assessed under Schedule D instead of Schedule B may prove that the woodlands are managed by him on a commercial basis to the Special Commissioners and not necessarily to the General Commissioners of income tax as required by the Act of 1915. The Section also provides that the requirement in the Act of 1915 that the election shall extend to all woodlands managed on the same estate shall not extend to woodlands planted or replanted after the passing of the Act of 1916 if the person occupying those woodlands gives notice to the General or Special Commissioners within a year after the planting or replanting that they are to be treated as being woodlands on a separate estate. Sub-section 3 of the same Section provides that the relief given to trading persons in case of loss by Section 23 of the Customs and Inland Revenue Act, 1890 (53 and 54 Vict., c. 8), shall, where a person occupying woodlands has elected to be charged to income tax in respect of those woodlands under Schedule D apply to losses on those woodlands as it applies to losses in any trade.

The Summer Time Act, 1916 (6 and 7 Geo. 5, c. 14), which advanced the time by clock for general purposes by an hour from May 21 to October 1 is so well known that it scarcely requires notice here. It was confined to the year 1916 in its operation, but a measure with the same object has now been passed for 1917.

The Small Holdings Colonies Act, 1916 (6 and 7 Geo. 5, c. 38), enables the Board of Agriculture and Fisheries during the continuance of the war and a period of twelve months thereafter for the purpose of providing experimental small holding colonies with the consent of the Treasury to acquire by agreement suitable land. Sub-section 2 of Section 1 gives to a tenant whose tenancy is terminated by a landlord with a view to the use of the land or part of the land by the Board for the provision of small holdings under the Act a similar

right to compensation for disturbance as is given in the case of the termination of a tenancy for the purposes of a sale of the land under the Agricultural Holdings Act, 1914. The total area of land that may be acquired by the Board under this Act is not to exceed 4,500 acres in England (excluding Monmouthshire) or 2,000 acres in Wales and Monmouthshire or 6,000 acres in all, and in the selection of persons to be settled on the land so acquired preference is to be given to persons who have served in the naval or military forces of the Crown in the present war. The Act contains other provisions as to the management of the land acquired which need not be noticed here.

II.—DECISIONS OF THE COURT.

1. *Labour*. The only cases noticeable under this head are cases under the Workmen's Compensation Act, 1906 (6 Edwd. 7, c. 58), which bear on the liability of the employer to workmen engaged in agriculture in respect of accidents arising out of and in the course of their employment. In the case of *Scott v. Pearson* (85 L.J.K.B., 825; [1916] 2 K.B., 61) the question arose as to whether cattle ringworm with which a farm attendant became infected could be treated as an injury by accident under the Act so as to give a right to compensation from the employers. The applicant was a girl who was employed to look after calves. She noticed at the beginning of February, 1915, that some of the calves had scabs on their necks and heads. The calves were kept in a pen, and when the girl went to feed them they used to push forward and try to get out. She had then to push them back, and sometimes she used a stick for this purpose and sometimes her hand. On February 13 she noticed that her arm was breaking out in scabs, and on seeing a doctor she was found to be suffering from cattle ringworm. She brought proceedings claiming compensation under the Workmen's Compensation Act, 1906. It was admitted by the employer that the calves had had the disease, which, according to the medical evidence, is contagious. The County Court judge held that, assuming the evidence for the applicant was true, no injury by accident had been proved, and he dismissed the application. The Court of Appeal held that the evidence as it stood showed that the girl's illness was an injury by accident, and that the case must go back to the County Court judge to be fully heard. Lord Justice Phillimore, in the course of his judgment, said "if a definite time, place, and occasion can be assigned for the contraction of a disease, and if the occasion was a part, but an unusual part, of the employment, an illness so produced may be deemed an injury by accident."

In *Joy v. Phillips, Muls & Co.* (85 L.J.K.B., 770; [1916] 1 K.B., 849) the question was whether the death of a stable-boy from the kick of a horse was an accident "arising out of his employment." The boy in question was found lying unconscious in his employer's stables, having been kicked in the head by a horse. He was found with a halter clutched in his hand and died without recovering consciousness. The horse that had kicked him was a quiet one. At the time of the accident the stables had been swept and the brooms put away, and the evidence was that the boy had nothing to do in the stable after the sweeping was finished, and certainly nothing to do with a halter. He was not, however, wrong in being in the stable; but evidence was given that the boy had been caught on former occasions teasing the horses with a broom or a halter. It was held that the evidence of the boy's habit of teasing the horses was admissible, and that the County Court judge had not misdirected himself in holding that it was not proved that the accident arose out of the employment.

Williams v. Hollings (1915, W.C. and Ins. Rep., 540) was a case under the same Act of a different character. The question was how the "average weekly earnings" of a fruit picker were to be calculated. The applicant was injured while picking damsons with the result that she was partially incapacitated from work. The only work she did during the year preceding the accident was damson picking for three weeks and two days. The arbitrator found that she was in a grade of damson pickers who only worked for six weeks in a year and awarded her compensation on that basis. He found that damson pickers earned about 11s. a week or a total amount of about 70s. during the year. He divided that sum by fifty-two and thus arrived at about 1s. 4d. as being the amount of the average weekly earnings and awarded a weekly payment of 8d., being 50 per cent. of that sum during her incapacity. She, however, claimed that she ought to have been treated as a fruit picker who worked for a much longer period than six weeks during the year and whose average weekly earnings would be higher than those of damson pickers. The Court of Appeal held that the arbitrator had properly computed the compensation.

2. *Stock*.—There have been several cases in the past year relating to injuries or accidents caused by farm animals on the highway. In *Pinn v. Rew* (32 Times L.R., 451) the defendant bought a cow and calf, and by his instructions a drover was employed to drive them to the defendant's farm. The drover got another man, who was about to drive bullocks in the same direction, to drive the cow and calf along with them. On the way the cow first tossed a dog and afterwards tossed the

plaintiff, who suffered injury thereby and brought an action for damages for negligence against the farmer. Evidence was given that a cow with a calf might become dangerous if it met a dog, and the judge found (1) that the drover was negligent as it was his duty to see that the cow was under control; (2) that the defendant was negligent in employing one man to perform a dangerous operation for which his powers were inadequate; and (3) that even if the drover was an independent contractor this was no defence, and he awarded damages to the plaintiff. It was held on appeal that there was evidence to support the judge's finding of negligence and he was entitled to hold that the drover was employed to do a dangerous thing on the highway, and that therefore even if the drover was an independent contractor the judge was right in finding the defendant liable.

Heath's Garage Limited v. Hodges (85 L.J.K.B., 1289; [1916] 2 K.B., 370) was a very important case on the liability of farmers for accidents arising from farm animals straying on the highway, in which it was definitely laid down that the owner of harmless domestic animals such as sheep is not under any duty at common law to prevent their straying on the highway; and although under the Highway Act 1864 (27 and 28 Vict., c. 101) he is liable to a penalty for allowing them to stray on to the highway that Act imposes no civil liability in respect of animals trespassing on the highway. The case arose in this way:—Some twenty sheep belonging to the defendant strayed on to a highway from a field adjoining it owing to insufficiency of the fence, and two of the sheep having become separated from the others attempted to run across the road in front of the plaintiffs' motor car with the result that they collided with it and caused it to be overturned and damaged. It was held that the defendant was not liable in damages either on the ground of negligence or of nuisance to the highway, as, apart from his liability to be fined under the Highway Act, 1864, Section 25, he was under no duty to fence his land so as to prevent sheep straying on the highway. Mr. Justice Neville, in the course of his judgment, said: "In my opinion the experience of centuries has shown that the presence of domestic animals upon the highway is not inconsistent with the reasonable safety of the public using the road. I am unable to draw any distinction in this regard between domestic animals. I think horses, cattle, sheep, pigs, fowls, and dogs all fall into the same category for this purpose. There is no doubt that the advent of motor cars has greatly increased the danger resulting from the presence of loose animals on the road, owing to the speed at which the cars travel and the difficulty shared by man and beast in avoiding them. It is only yesterday, however,

that, as mechanically propelled carriages, the right of motor cars to use the road was subject to conditions which rendered great speed unattainable; and I think that to-day those who use them must take the roads as they find them, and put up themselves with such risks as the speed of their cars occasion, not only to themselves but to others." The case, however, of *Turner v. Coates* (33 Times L.R., 79) shows that the law as thus laid down does not apply to the case of an animal on the highway of a naturally dangerous character, such as an unbroken colt. In that case the plaintiff was riding a bicycle along a highway about 7 p.m. in January. She had a lamp on her bicycle which was burning properly. The defendant, a farmer, wishing to move a colt of about 18 months old and unbroken from one farm to another was bringing the colt along the road. In front he had a boy leading a mare; then came the colt, and behind the colt the defendant was driving a trap to keep the colt from bolting back. When the plaintiff approached on her bicycle the colt was startled by the light on the bicycle, darted from one side of the road to the other, and knocked the plaintiff over, causing injuries for which she sued the defendant. It was held that as the colt had done just what in the circumstances it might have been expected to do the defendant was liable. The Court said that the mere fact that a domestic animal strayed on a highway and caused damage did not necessarily make its owner liable, but the animal in this case was one which was likely to do harm, and which every one must have known was likely to do so. If a person placed on a highway an animal likely in certain circumstances to do harm he must take reasonable precautions to prevent it from doing harm.

Holgate v. Bleazard (86 L.J.K.B., 270) related to damage caused by farm animals, but in this case not to persons on a highway, but to the owner of a neighbouring farm, so that the question was altogether a different one. Two adjoining farms was let by the same landlord to different farmers, each of whom was under a covenant with the landlord to keep the fences in repair, but the covenant did not in express terms make it obligatory to maintain such a fence as would prevent animals from straying. Some of the horses of the defendant got out of a field occupied by him and injured a colt of his neighbour, the plaintiff, for which damage the latter sued. It appeared in evidence that if the plaintiff had performed his obligation of keeping his fences in repair the horses would not have broken through. The Court held that the general rule applied that the owner of animals is bound to prevent them from trespassing on to the land of others, unless the owner of the land upon which the trespass takes place is bound by

prescription or otherwise to maintain fences which would keep the animals out. The obligation, however, in the case of the plaintiff to his landlord to maintain his fences did not prevent the general rule from applying. The defendant was therefore liable for the damage to his neighbour's animal under the general rule.

3. *Landlord and Tenant.* The decisions relating to the law of landlord and tenant as affecting agricultural tenancies both under the general law and the Agricultural Holdings Acts have been unusually numerous of late and are of some importance. It is proposed to deal first with cases under the general law.

In *Williams v. Lewis* (85 L.J.K.B., 40; [1915] 3 K.B., 493) it was decided that a farmer occupying land as yearly tenant under a verbal agreement impliedly agrees with his landlord to cultivate the whole of the land in his occupation in a husband-like manner according to the custom of the country, whether the land is or is not in good condition at the commencement of his tenancy, and the measure of damage for breach of this implied agreement is the injury to the reversion caused by the breach. The diminution of rent that the landlord will get on re-letting or the allowance which he may make to an incoming tenant owing to the unsatisfactory condition of the farm may be a fair indication of the loss sustained by the landlord by reason of the breach, but such loss must be proved in the usual manner. The farm in this case was in Monmouthshire, and the defendant was sued by his landlord for damages for breach of the implied agreement to cultivate in a husbandlike manner according to the custom of the country. The defendant contended (amongst other things) that he had fulfilled his obligation by leaving the land in the same condition as when he took it. Mr. Justice Bray, in the course of his judgment, said: "In my opinion this contention is not sound in law. It may well be that a considerable course of proper farming will restore the land to proper condition. If so, the landlord has a right to have the land delivered up in proper condition. In the same way, if at the commencement of the tenancy the land is in better than proper condition as the result of what is called high farming, the tenant is not, in my opinion, bound to keep the land in better than proper condition so long as he farms properly. Arising out of this there was a contention that, if the tenant during the tenancy has raised the land to a better condition than it had been at the commencement he might during the last year or two lower it to the former condition. That contention is, in my opinion, equally unsound. He must continue to farm properly to the end of his tenancy. He need not do more than that, but he must do that." The learned

Judge defined "proper condition" as the condition of the land when it has been properly farmed according to the obligation to cultivate in a husbandlike manner for a lengthened period. He further said: "I must guard myself by saying that this does not involve the proposition that if the tenant has at any time got the land into a condition better than proper condition he must always keep it so, but merely that he must not lower it by *improper* farming. For instance, if he has been putting a lot of dung on a field, it might not be improper farming in the case of grass land to mow it two years running, or in the case of arable to have two crops of corn running." His Lordship also held that the damages for not farming properly were not confined so far as loss of fertility was concerned to the manurial value of hay or straw improperly removed, but included the whole injury to the reversion of which the reduction of rent made to an incoming tenant may be a fair indication. The damages for improper cultivation and neglect of hedges and ditches were in this case assessed at 83/. 12s. 6d. on a 61-acre farm.

Wedd v. Porter (85 L.J.K.B., 1298; [1916] 2 K.B., 91) is another very instructive case. It was held there that where on the expiration of a lease for a term of years the tenant remains in possession and pays rent, and a tenancy from year to year is thus constituted, it is a question of fact in each case whether the tenant holds upon the terms of the expired lease. Where the facts show an express or implied agreement to hold upon the terms of the expired lease, then the law determines that the tenant holds subject to all the covenants in that lease which are applicable to a yearly tenancy. Otherwise the tenant holds only upon the implied terms which the law introduces into such a tenancy. In this case there were discussions on the determination of the lease in 1892 as to the terms of a new tenancy and negotiations as to repairs, mode of cultivation, the shooting rights and other matters, and the Court came to the conclusion that the parties agreed that the terms of the old lease should not apply but never agreed upon the terms of any new arrangement except that there should be a yearly tenancy at 850/. rent. This yearly tenancy was determined by notice to quit on September 29, 1913, and thereupon the plaintiffs, who were at that date the landlords, having purchased the reversion shortly before, sued the tenants for damages for failure to repair the buildings in accordance with the covenants in the lease and for not keeping the land in a proper state of cultivation. The Court having held, as above stated, that the terms of the expired lease were no longer binding on the defendants, decided that the only terms applicable as implied by law in case of a yearly tenancy of that description

were to cultivate the land in a husbandlike manner according to the custom of the country subject to the provisions of the Agricultural Holdings Act, 1908, and to keep the buildings wind and water-tight with no liability to sustain and uphold the premises. It was further held that the plaintiffs, as assignees of the reversion, were entitled to maintain a claim for breaches of implied obligations on the part of the tenants which had occurred since the conveyances to them but not for breach of such obligations committed prior to the conveyances if, as was the case, accrued causes of action were not expressly assigned to them thereby.

Dick v. Norton (85 L.J.Ch., 623) was a case relating to a lease of sporting rights. The defendant let to the plaintiff the right of shooting over his farms, and the plaintiff consented to permit the defendant to enter the coverts at any reasonable time consistent with non-disturbance of game for the purpose of thinning plantations, felling trees, or any necessary forester's work, and the defendant covenanted for quiet enjoyment. The defendant sold the timber on the farm in 1915 for 2,500% to a purchaser who contracted to sell the greater part of it for munition works. The plaintiff then moved to restrain him from felling the trees as being a disturbance of the game. It was held that the demise of the shooting rights did not prevent the lessor from turning his property to the best advantage, that there was no implied covenant by the lessor not to disturb the game, and therefore there was no case for an injunction.

There have been six cases decided under the Agricultural Holdings Acts which require notice. In *Lendon v. Keen* (85 L.J.K.B., 1237; [1916] 1 K.B., 994) there had been an arbitration under the Agricultural Holdings Act, 1908. The landlord was dissatisfied with the award, alleging that although she had applied to the arbitrator under paragraph 10 of the Schedule to the Act to specify the amount awarded in respect of unreasonable disturbance of the tenant, the arbitrator had improperly refused or neglected so to do. She accordingly took proceedings to have the award set aside under paragraph 13 of the Schedule upon the ground that the arbitrator had misconducted himself. The County Court Judge found that the landlord had in fact applied to the arbitrator to separate the figures and he had not done so. No suggestion was made imputing anything in the nature of dishonesty or bad faith to the arbitrator, but the Judge referred the award back to the arbitrator and ordered him to pay the landlord's costs. The arbitrator appealed from this decision. It was held that where an arbitrator appears and takes part in proceedings to set aside his award he makes himself an active party to the application

and costs can be given against him. Where the arbitrator has been guilty of such collusion as would entitle a party to the arbitration to bring an action against him, and the award is set aside on the ground of such misconduct, costs ought to be given against him whether he appears in the County Court or not. Where, however, an arbitrator appears but takes no active part in the litigation, and no suggestion of bad faith or dishonesty is made against him, the Judge has no power to award costs against him. As the latter was the case here the order for payment of costs by the arbitrator was set aside and the landlord's costs were ordered to be paid by the tenant, who endeavoured to uphold the award which the County Court Judge referred back.

Gray v. Ashburton (Lord) (86 L.J.K.B., 224; [1917] A.C. 26) was a case that went up to the House of Lords relating to an arbitration under the Agricultural Holdings Act. The appellant was tenant of a farm, the lease of which expired at Michaelmas, 1913. The respondent claimed a sum of 744*l.* for dilapidations and the appellant disputed his liability to pay. The case was referred to arbitration, and the arbitrator stated a case for the opinion of the County Court Judge. The case was taken to the Court of Appeal, and the Court held that the appellant was liable for dilapidations and referred the case back to the arbitrator to determine the amount. He awarded 71*l.* to the respondent and that each party should pay his own costs of the special case and the proceedings thereon in the County Court and the Court of Appeal, and that the rest of the costs should be borne by the respondent. The respondent applied to the County Court to set aside this award but the Judge refused to do so and his decision was affirmed by the Divisional Court. The matter then went to the Court of Appeal who reversed this decision, holding that under the circumstances the arbitrator had no power to make the successful party pay the costs of the appeal. The tenant appealed to the House of Lords who allowed the appeal, holding that under clauses 14 and 15 of Schedule II. of the Agricultural Holdings Act, 1908, the arbitrator has an absolute discretion as to costs which cannot be interfered with in the absence of misconduct on his part.

In *Sylvester v. Brown* (85 L.J.K.B., 1173) it was held that in the case of termination of a tenancy of an agricultural holding by the landlord a claim for compensation by the tenant against his landlord for unreasonable disturbance under Section 11 of the Agricultural Holdings Act, 1908, proviso (d) is not required to be in writing but may be made verbally. It is to be observed, however, that the first notice of intention

to claim to be given within two months after receipt of the notice to quit must under proviso (b) of the same Section be made in writing. It is only the actual claim which is to be made within three months after the time that the tenant quits the holding that according to this decision may be verbal.

Meggesson v. Groves (51 Law Journal N.C., 549; [1917] Ch., 158) raised the question whether a tenant could sell during the last year of his tenancy hay produced during previous years without the consent of his landlord. The tenancy was terminated by notice to quit on March 25, 1916. Under his agreement the tenant contracted to "stack upon the premises all the hay and corn that shall grow thereon and not to sell or dispose of any hay, straw or oats without the consent in writing of the landlord." Section 26 Sub-section 11 of the Agricultural Holdings Act, 1908, provides that "notwithstanding any custom of the country, or the provisions of any contract of tenancy or agreement respecting the method of cropping arable lands, or the disposal of crops, a tenant of a holding shall have full right to practise any system of cropping of the arable land on the holding and to dispose of the produce of the holding without incurring any penalty, forfeiture, or liability"; but "this Sub-section shall not apply as respects the year before the expiration of the contract of tenancy." The tenant contended that under this Section he was entitled without his landlord's consent during the last year of his tenancy to dispose of hay produced during previous years, and that the concluding proviso quoted above only applied to hay produced in the last year. It was held that this contention was incorrect, and he was prohibited in the last year from selling hay produced either in that year or in a previous year as the proviso in the Act was not confined to hay produced in the last year of the tenancy.

Galloway v. McClelland (1915 S.C., 1062) was an important case decided by the Court of Session in Scotland under the Agricultural Holdings (Scotland) Act, 1908, which corresponds in all material respects with the English Act. It was held by the majority of the Court (six of the Judges dissenting) that a tenant is not entitled to compensation for making an improvement comprised in the First Schedule to the Act if the improvement was one which he was bound by his lease to execute. The claim in question was for temporary pasture laid down with seeds sown more than two years prior to the determination of the tenancy (Item 26 in Part III. of the First Schedule to the Act) for which a tenant is entitled to compensation without notice to or consent by the landlord. The Court held that the tenant was not entitled to compensation in this respect as the temporary pasture for which he claimed

was laid down in accordance with the rotation of cropping prescribed by the lease, a similar acreage having been under temporary pasture at the commencement of the lease and the lease stipulating that an equal extent of temporary pasture should be maintained on the holding during the currency of the lease and left on the holding at its termination. It was further held that even if the tenant were entitled to compensation for the improvement in question there must be set against his right to compensation the temporary pasture which was handed over to the tenant free of charge on his entry, as being in the terms of Section 1 Sub-section 2 (a) a "benefit" which the landlord had given or allowed to the tenant in consideration of his executing the improvement, although it was not specially mentioned in the lease and allowed as a benefit.

In another Scottish case, *Buchanan v. Taylor* (1916 S.O. 129), a farm lease dated in 1903 (which renewed a previous lease to the same tenant in 1884) contained a schedule of compensation for unexhausted improvements, and also a clause providing that whereas the proprietor had paid a claim for compensation by the previous tenant at his outgoing in 1884, "therefore the parties hereto have agreed that the sum represented in said claim shall form a deduction from the amount payable to the tenant at the termination of his tenancy." It was held, first, that the agreement was not one depriving the tenant of his right to compensation within the meaning of Section 5 of the Agricultural Holdings (Scotland) Act, 1908 (which is practically identical with Section 5 of the English Act), and therefore was not void; and, secondly, that the agreement did not form part of a substituted scale of compensation, and accordingly did not require to be submitted to the determination of the arbitrator.

4. *Produce.* In *Hunt v. Richardson* (85 L.J.K.B., 1360; [1916] 2 K.B., 446) the appellant was a farmer and cowkeeper, and he was charged with selling to the prejudice of the purchaser milk not of the nature, substance, and quality demanded contrary to Section 6 of the Sale of Food and Drugs Act, 1875 (38 and 39 Vict., c. 63), and the analyst's certificate showed that the milk was deficient in milk fat to the extent of 9 per cent. Regulation 1 of the Sale of Milk Regulations, 1901, provides that when a sample of milk contains less than 3 per cent. of milk fat it shall be presumed for the purposes of the Sale of Food and Drugs Acts, until the contrary is proved, that the milk is not genuine by reason of the abstraction therefrom of milk fat, or the addition thereto of water. The appellant's cows were milked twice daily, at 5 a.m. and 1 p.m.—the usual hours in the district—and nothing was added to or abstracted

from the milk beyond the abstraction of impurities by straining in the ordinary way. Owing to heavy rains the grass on which the cows were fed was in a watery condition, and for the purpose of keeping up the quantity of milk they were also fed on green maize, with the result that the quantity of the milk was increased at the expense of its quality. The purchaser asked for "new morning milk" and was supplied with milk as it came from the cow, subject to the aforesaid straining. The Justices found that the deficiency of 9 per cent. in milk fat was due to the manner in which the appellant had fed his cows with the object of obtaining a large supply of milk without regard to quality, and they held that the milk was not of the nature, substance, and quality demanded by the purchaser, and convicted the appellant. The King's Bench Divisional Court (with two dissentient judges), however, held that this conviction must be quashed, as the milk was milk as it came from the cow and therefore genuine milk and of the nature, substance, and quality demanded by the purchaser. On the other hand, in an Irish case of *Belfast Guardians v. Jones* ([1916] 2 Ir.R., 269) the respondent had contracted to sell to the appellants new milk containing not less than 3 per cent. of milk fat. Some of the milk supplied contained less than this proportion. It was held that the respondent was liable to a penalty under the Sale of Food and Drugs Act, 1875, although the milk was supplied in the same state as that in which it came from the cow.

In *Wilkinson v. Clark* (85 L.J.K.B., 1641; [1916] 2 K.B., 636), on a charge of selling milk not of the nature, substance, and quality demanded, the prosecution sought to adduce evidence that a sample taken on the following day from the same cows was of the proper nature, substance, and quality, so as to show that the milk in question, which was not, must therefore have been adulterated, and the evidence was held admissible for that purpose only.

5. *Land Valuation and Taxes.* In *Attorney General v. Foran* (85 L.J.Ch., 370; [1916] A.C. 128) it was held that where the surface of land is occupied separately from the minerals under it, such minerals ought to be treated as a separate parcel of land for the purposes of valuation under the Finance (1909-10) Act, 1910 (10 Edw. 7, c. 8), and a form served on the owner dealing with the land in the occupation of the tenant of the surface is not a proper mode of requiring a return of the particulars relating to the minerals, but the owners are entitled to make a separate return in respect of such minerals on a proper form in pursuance of a further notice. The land in question was a farm in Kent, and in filling up the form (Form 4) served on them in respect thereof

the owners stated that they were proprietors of the minerals, but made no return as to their value. The farm with the mines and minerals below it was afterwards sold for a considerable sum, and the Commissioners of Inland Revenue claimed increment value duty on the basis that the minerals were of no value at the commencement of the Act as the owners had made no estimate of their value pursuant to Section 23, Sub-section 2 of the Act, which provides that where minerals are not comprised in a mining lease or being worked they shall be treated as having no value unless the proprietor of the minerals in his return furnished to the Commissioners specifies the nature of the minerals and estimates their capital value. Their claim, however, was held bad as above stated because the owners had not been properly asked to make a return as to the minerals but only as to the surface land.

Ferguson v. Inland Revenue Commissioners (86 L.J.K.B., 154; [1917] 1 K.B., 193) was a case relating to undeveloped land duty which is charged by Section 16 of the Finance (1909-10) Act, 1910, on all land not developed "by the erection of dwelling-houses or of buildings for the purposes of any business, trade, or industry other than agriculture . . . or is not otherwise used *bonâ fide* for any business, trade, or industry other than agriculture," excluding land whose site value does not exceed 50l. an acre. The land in question was 93 acres containing brick earth. On about 49 acres buildings for the manufacture of bricks had been erected and in about 5 acres of this plot the brick earth was still unworked and would be sufficient to carry on the works for 5 years. The remainder of the 93 acres was let for short terms in 3 plots as arable land and nursery gardens. It was found that the brick earth in these 3 plots was necessary as a reserve of brick earth for the successful working of the undertaking on the rest of the land. It was held that these three plots so kept in reserve but used for agricultural purposes were not "developed" within the meaning of the Act and must therefore bear undeveloped land duty.

6. *Miscellaneous.* Under this heading there appears to be only one case in the past year which requires notice as being of interest to agriculturists. *Hudson v. Bray* (33 Times L.R., 118) was a case where an elm tree on the defendant's land was blown down on a December night in a violent gale and fell across the highway. The defendant having been informed of the occurrence early in the next day did some work with the object of removing the tree, but was unable to complete the removal and when work ceased for the day the tree was still across the road without a light to warn people of the obstruction. The plaintiffs drove in a motor car along the road after

it was dark and the lights on the car did not shine on the tree. The road was unlighted and the car ran into the tree, and the car and its occupants were injured. The plaintiffs brought an action for damages. The County Court Judge held that the defendant was negligent in not taking steps to warn persons travelling on the highway of the obstruction, and gave judgment for the plaintiffs for 50%. On appeal the Divisional Court reversed this decision, holding that the tree had fallen by the act of God and there was no duty on the defendant to light it and guard it although he would have been liable if he had failed after receiving a notice from the surveyor of highways to remove the tree within a reasonable time.

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AGRICULTURAL STATISTICS, 1916.

[The Society is again indebted to the Board of Agriculture and Fisheries for their kindness in supplying, for inclusion in the Journal, the usual tables of agricultural statistics. For fuller information than can be given in the space available here, the Department's own admirable series of Reports on Agricultural Statistics should, of course, be consulted.—Ed.]

ACREAGE.

Particulars of the acreage under each crop and of the numbers of each class of live stock in 1916 are given in Table I. It is noteworthy that the total area devoted to agriculture in Great Britain¹ shows for the first time in twenty-five years an increase instead of a decrease on that of the previous year. The net gain of 15,000 acres, though not important in itself, becomes of satisfactory significance when the total cultivated area is dissected into grass and arable land.

The 1916 returns contrast strongly with the tendency of so many years past for the ploughed field to revert to pasture, the area under Arable Land having actually increased by 100,000 acres over 1915, whereas Permanent Grass shrunk by some 84,000 acres. Proportionately the most notable change was in Wales, where arable land increased by 56,000 acres, or over 8 per cent. In England the gain of 29,000 acres did not

¹ Although for purposes of reference Tables I. and II. give details also for Ireland and the United Kingdom as a whole, exigencies of space make it necessary to restrict the review to Great Britain, and more particularly to England and Wales.

outweigh the decline in 1915, when nearly 34,000 acres of arable land were lost as compared with 1914, and therefore the area utilised for crops in 1916 was less than when the war commenced. Scotland, although increasing its arable land by 14,000 acres, lost more than a corresponding amount of pasture, and, unlike England and Wales, suffered a net contraction in the total area under crops and grass.

The allocation of the land amongst the various crops in the sowing season 1915-16, presented, of course, unusually complex problems in view of the uncertainties as to prices and overseas supplies, in addition to the doubts as to the sufficiency of labour. A discussion of these questions hardly comes within the scope of this article, but it is of interest to see how they were answered in the actual cropping. The acreage in Great Britain under Cereals as a whole showed no very great change, but the distribution amongst the individual corn crops varied considerably, especially by comparison with the changes in the previous year. Whereas in 1915 both wheat and oats showed large increases and barley a similarly considerable decline, the alterations for the 1916 production were quite the opposite as regards wheat and barley. No less than 271,600 acres less Wheat were sown for 1916 than for 1915, the decrease in England (where the bulk of this crop is grown) being 259,000 acres. It must be remembered, however, that 1915 had a record wheat acreage, and that the gain in that year of 351,000 acres on the area under the crop in the season immediately preceding the war was maintained to the extent of 100,000 acres in 1916. Indeed, the total area devoted to wheat in England in 1916 was 10 per cent. above the average of the decade 1905-14.

Barley, which had declined in Great Britain to the extent of nearly 318,000 acres in 1915, showed the considerable recovery of 121,000 acres in 1916, the gain in England being 93,000 acres (8 per cent.), but the total area under this crop was lower than in any year except 1915. The large increase in the acreage under Oats in 1915 was more than maintained in 1916, a further 5,000 acres being assigned to this crop. The addition in Great Britain as a whole, however, was due to the gain of 8,000 acres in Scotland and 23,000 acres in Wales, which more than counterbalanced the loss of 26,000 acres in England.

Pulse crops showed a continuation of the shrinkage of the previous year, the area in England being reduced by 30,000 acres (11 per cent.) in the case of Beans, and by nearly 17,000 acres (13 per cent.) in that of Peas, the acreage of the latter being the lowest ever recorded.

The drop of 6,000 acres in the Great Britain Potato area in 1915 was followed by the loss of another 50,000 acres (8 per

cent.) last year, the total area being 558,000 acres as against 614,000 acres on the outbreak of war, when the area was the highest on record. The acreage of potatoes had not been so low as that in 1916 since 1910. The reduction over 1915 was made up of about 35,000 acres in England and Wales and 14,000 acres in Scotland. Compared with the average of the five years preceding the war, it is of interest to note that in 1916 the area in the United Kingdom as a whole of the two principal crops for direct human food showed, in the case of wheat, a gain of over 157,000 acres (8 per cent.), but in that of potatoes a loss of 30,000 acres (nearly 3 per cent.).

No further reduction occurred in 1916 in Turnips and Swedes (there was a loss in 1915 of 123,000 acres), the area in Great Britain as a whole remaining almost stationary, a drop of 6,700 acres in Scotland being balanced by a gain of nearly the same amount south of the Tweed.

Mangolds were further curtailed in England, the reduction in 1916 being 35,000 acres (9 per cent.), making the area under this root the smallest for nearly twenty years. The area under Clover, Sainfoin, and Rotation Grasses in Great Britain in 1916 increased by 244,000 acres, or over 6 per cent., which is a sharp contrast to the persistent decline in these crops for some years past. The greater part of the increase was in England and Wales, where 228,000 acres were gained (as against a loss of 19,000 acres in the previous year). Of the minor crops, the most notable change was the decrease of 21,000 acres, or nearly 20 per cent., in Vetches.

The ground left as Bare Fallow in 1916 was the largest extent for twelve years past, being 114,000 acres more than in 1915, an increase of over a third. This addition to the area left unsown more than neutralised the gain of 100,000 acres in the total arable land. Probably the difficulties in carrying on field work in the very adverse weather conditions in the spring, together possibly with the labour shortage, were responsible for the farmers' original plans being thus to a certain degree unfulfilled.

LIVE STOCK.

The diminution in the number of Horses actually in use in agriculture (including mares kept for breeding), which had been proceeding regularly since 1910, received a check in 1916, the number in Great Britain in that year increasing by 48,000, or nearly 6 per cent. The improvement was general in the three countries. The concurrent decline in horse breeding also received a substantial check in 1916, the numbers of unbroken horses (including stallions for service) having been increased by 19,000 one-year-olds and above, and by 12,000

foals, the total number in the latter category being the largest since 1910, when there were 126,000. The number of stallions for service increased from 8,816 to 9,388, making an addition of 572 to the 189 gained in the previous year.

The number of Cattle in 1916 surpassed all records, that in Great Britain being as much as 154,000 (2 per cent.) greater than the record number of 1915. From the point of view of potential meat supply it is highly satisfactory to note that the total number of cattle in the United Kingdom when the returns were collected in June last was 267,000 higher than in June, 1914. Examining the different classes it will be found that, despite the increase in the total number of cattle, the number of cows and heifers (both in milk and in calf) in Great Britain decreased by 13,000. The milking herd in fact diminished from 2,243,000 in 1915 to 2,210,000 in 1916, which, following a similar drop in the previous year, is of special significance in view of the allegations that farmers make undue profits out of milk. Cows and heifers in calf increased by 21,000 head in England and Wales, thus nearly recovering the 24,000 lost in the previous year, but in Scotland the loss of 2,000 in 1915 was repeated in 1916. As a net result the number of cows and heifers in Great Britain in 1916 kept for breeding (660,000) was 6,000 less than in the June preceding the outbreak of war. The previous years' gains in each of the categories of "other cattle" were continued in 1916, the beasts aged two years and above increasing by 73,000 ($7\frac{1}{2}$ per cent.) in England and Wales and 10,000 in Scotland; 77,000 additional young stock of one year and under two were kept in England and Wales, and 4,000 more in Scotland. The total increase in calves was by comparison rather small, there being in fact a drop of nearly 3,000 in Scotland, set off by an increase of 2,000 in England and 4,000 in Wales. The fact, however, that calves have been maintained well up to the record numbers of 1915 is sufficient disproof of accusations of excessive slaughtering of immature stock. The categories of both calves and stock from one to two years old are now at the highest numbers ever recorded.

For the third year in succession the numbers of Sheep in Great Britain were again on the upward trend, and the 408,000 added to the stock in 1916, together with the gain in the previous years, make a total recovery of over 1,000,000 from the record low numbers of 1913. The increase was particularly noticeable in Wales, where the addition of 181,000 (5 per cent.) to the 1915 flock brought the total number of sheep in the Principality up to the record figure of 3,879,000, which is over 80,000 in excess of the previous high-water mark of 3,795,000 in 1909. Now that the temporary set-back of 1913 has been

more than made up, the steady growth of the sheep-rearing industry in Wales has resulted in a gain of over 20 per cent. on the numbers kept twenty years ago. A most promising feature of the returns from all three countries is the rise in the number of breeding ewes, the increase in England of 80,000 considerably more than compensating for the reduction of 17,000 which took place in 1915. The greatest gain was that of 95,000 (6 per cent.) in Wales. Other sheep, one year old and above, similarly showed general increases, the total increase of 150,000 being made up of 60,000 in England, 55,000 in Wales, and 34,000 in Scotland. The net gain of 70,000 in the head of lambs was due to the increase of over 107,000 (2 per cent.) in England, and 30,000 in Wales. The reduction of nearly 70,000 in the number of lambs in Scotland completely cancelled the gain in other classes of sheep in that country.

In strange contrast to the thriving numbers of cattle and sheep, the stock of Pigs underwent a severe thinning-out in 1916, there being a diminution of 265,000 (over 10 per cent.) in Great Britain as a whole. Following the reduction of 55,000 in 1915 there are now 12 per cent. less pigs in the country than before the war. Breeding sows did not fall relatively so much as other pigs, the drop in the former being not more than 5 per cent. Each country shared in the reduction, England, particularly, losing another 14,000 sows beyond the 40,000 lost in the previous year. Scotland, which, unlike England and Wales, had managed to increase its herd of "other" pigs in 1915, in losing 12,000 of them in 1916, lost more than half as much again as the previous increase. This class of pigs fell off by 237,000 in England and Wales, and in declining to 1,885,000 approached the record minimum of 1,821,000 of 1913.

PRODUCE OF CROPS.

The production of Wheat in Great Britain in 1916 (see Table II.) showed a reduction of 1,716,000 quarters (20 per cent.) on the exceptionally high figure of the previous year. Not only was there a smaller area sown, but the average yield per acre turned out at over $2\frac{1}{2}$ bushels less than in 1915, and $3\frac{1}{4}$ below the average of the previous ten years.

In England the yield per acre was the lowest since the failure of 1904 (when it was only $26\frac{1}{2}$ bushels). Since that year the yield had only dropped below 30 bushels on one other occasion (1912, when it fell to $28\frac{3}{4}$). Owing, however, to the acreage, although less than in 1915, being still well above that before the war, the total production in England—6,657,781 quarters—was larger than in 1912 and 1913, and was only about 150,000 quarters below the average of the five years preceding the war.

TABLE I.—Acreage under Crops and Grass; and Number of Live Scotland, Great Britain, Ireland, and the United Kingdom

	England		Wales		Scotland ⁴	
	1916	1915	1916	1915	1916	1915
Total Area (excluding water)	Acres 32,387,409		Acres 4,750,165		Acres 19,089,683	
Total Acreage under Crops and Grass ¹	24,317,993	24,310,744	2,756,091	2,742,356	4,775,506	4,781,897
Arable Land	10,302,153	10,372,673	748,948	693,034	3,303,741	3,289,902
Permanent Grass ¹	14,015,840	14,038,071	2,007,143	2,049,322	1,471,765	1,491,995
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Wheat	1,883,211	2,121,519	49,907	48,651	63,083	70,654
Barley or Bere	1,244,639	1,151,544	87,437	80,178	169,739	149,346
Oats	1,862,502	1,888,568	222,172	199,479	990,589	982,601
Rye	52,840	46,907	638	774	5,742	4,813
Beans	235,080	265,288	1,177	1,229	5,440	5,382
Peas	112,068	128,888	615	495	591	665
Potatoes	399,586	436,940	23,362	26,459	130,119	144,393
Turnips and Swedes	885,477	881,103	52,682	50,763	414,820	420,995
Mangold	366,818	402,262	11,319	11,461	2,347	2,503
Cabbage	46,371	49,480	840	781	4,673	4,809
Kohl-Rabi	14,496	17,944	109	61	10	10
Rape	64,704	60,862	6,121	4,668	7,892	6,290
Vetches or Tares	88,484	109,243	630	887	11,199	11,124
Lucerne	53,895	52,705	272	297	13	14
Hops	31,852	34,744	—	—	—	—
Small Fruit	72,418	73,274	811	913	7,127	7,054
Clover, Sainfoin, and Grasses under Rotation	2,311,267	2,101,761	279,043	260,604	1,480,329	1,463,986
Other Crops	180,992	144,445	1,792	1,465	2,373	2,299
Bare Fallow	418,953	305,200	4,033	4,439	6,195	6,974
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Horses used for Agricultural purposes ²	No. 691,737	No. 656,166	No. 81,033	No. 72,913	No. 133,463	No. 128,953
Stallions ³	6,805	6,870	1,452	1,319	1,131	1,127
Unbroken } One year and above	184,081	168,888	34,833	33,190	33,380	31,395
Horses } Under one year	88,504	80,522	21,305	18,730	14,904	13,293
Total	971,127	911,946	138,621	128,142	182,378	174,668
Other Horses	226,633	226,444	23,185	23,650	24,412	24,036
TOTAL OF HORSES	1,197,760	1,138,390	161,806	148,792	207,290	198,704
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Cows and Heifers in milk	1,606,975	1,633,272	248,479	248,402	354,408	361,077
Cows in calf but not in milk	235,373	231,176	26,677	25,997	41,056	43,337
Heifers in calf	291,300	269,259	30,978	26,397	45,312	44,779
Other Cattle:—Two years and above	982,513	922,227	85,252	73,101	239,254	229,602
" " One year and under two	1,171,714	1,101,556	203,375	195,067	297,620	293,392
" " Under one year	1,125,690	1,123,457	213,365	214,643	248,724	261,336
TOTAL OF CATTLE	5,403,685	5,280,947	812,116	783,207	1,226,374	1,233,933
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Ewes kept for Breeding	5,382,821	5,303,000	1,664,186	1,568,738	3,018,780	3,004,908
Other Sheep:—One year and above	2,818,250	2,758,152	778,711	723,495	1,253,733	1,219,480
" " Under one year	5,870,783	5,763,344	1,436,272	1,405,848	2,783,851	2,851,400
TOTAL OF SHEEP	14,071,854	13,821,496	3,879,169	3,698,081	7,055,864	7,075,798
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Sows kept for Breeding	253,754	267,497	20,243	20,666	17,588	17,652
Other Pigs	1,723,712	1,939,088	161,232	182,776	128,602	141,405
TOTAL OF PIGS	1,977,466	2,206,585	180,475	213,442	146,390	159,057

¹ Not including Mountain and Heath Land.² Including Mares kept for Breeding.³ Above two years old, used, or intended to be used, for service.⁴ Furnished by the Board of Agriculture for Scotland.⁵ Figures for Jersey include Water.

Stock, as returned on June 4, 1916 and 1915, in England, Wales, (including the Isle of Man and the Channel Islands).

	Great Britain		Ireland ⁷		United Kingdom.	
	1916	1915	1916	1915	1916	1915
Total Area (excluding water)	Acres 58,207,247		Acres 20,248,099		Acres 78,640,799 ⁸	
Total Acreage under Crops and Grass ¹	31,849,580	31,834,497	14,714,277	14,719,688	46,687,512	46,675,407
Arable Land	14,354,842	14,355,609	5,050,234	4,998,903	19,499,475	19,346,593
Permanent Grass ¹	17,494,748	17,578,888	9,664,043	9,720,785	27,188,037	27,328,814
Wheat	1,975,291	2,240,824	78,438	88,530	2,053,569	2,385,091
Barley or Bere	1,501,815	1,381,088	150,063	141,588	1,653,378	1,524,316
Oats	3,075,263	3,070,848	1,071,593	1,088,661	4,171,353	4,182,296
Rye	59,218	52,494	6,811	7,440	65,971	60,040
Beans ⁹	241,697	271,897	9,911	1,032	242,803	273,016
Peas	113,274	130,046	148	180	113,474	130,307
Potatoes	578,067	607,722	538,308	594,467	1,155,404	1,214,458
Turnips and Swedes	1,352,479	1,352,551	262,814	265,122	1,623,161	1,625,589
Mangold	380,454	416,226	80,434	82,728	461,833	499,804
Cabbage, Kohl-Rabi & Rape ¹⁰	145,176	144,835	37,282	39,009	183,348	184,584
Vetches or Tares ⁹	100,313	120,754	2,121	2,635	102,639	123,657
Hops	31,352	34,744	—	—	31,352	34,744
Small Fruit	80,556	81,241	15,567	15,885	96,250	97,438
Clover, Sainfoin, and Grasses under Rotation	4,070,639	3,826,351	2,649,908	2,594,822	6,763,011	6,482,279
Other Crops	239,337	201,225	108,951	79,003	361,459	282,104
Bare Fallow	430,081	318,613	—	—	430,495	318,870
Horses used for Agricultural purposes ⁶	No. 906,233	No. 858,032	No. 382,271	No. 359,848	No. 1,294,604	No. 1,224,055
Unbroken	—	—	—	—	—	—
Horses (including stallions). One year and above	261,882	242,189	83,843	76,970	346,962	320,542
Under one year	124,711	112,535	67,037	54,046	192,589	167,281
TOTAL OF HORSES	1,392,626	1,212,756	533,151	490,864	1,834,215	1,711,858
Cows and Heifers in milk or in calf	2,870,459	2,883,696	1,611,697	1,593,092	4,499,321	4,494,750
Other Cattle:— Two years and above	1,307,019	1,228,990	1,034,376	994,316	2,344,697	2,221,218
One year and under two	1,671,709	1,591,025	1,120,482	1,065,028	2,801,898	2,665,551
Under one year	1,592,969	1,589,436	1,203,886	1,191,859	2,805,854	2,789,993
TOTAL OF CATTLE	7,442,155	7,288,087	4,970,441	4,843,795	12,451,540	12,171,452
Ewes kept for Breeding	10,085,887	9,876,846	1,503,500	1,431,805	11,603,904	11,341,904
Other Sheep:— One year and above	4,850,894	4,701,137	720,298	699,809	5,576,513	5,397,745
Under one year	10,090,406	10,020,592	1,559,907	1,478,653	11,669,288	11,536,321
TOTAL OF SHEEP	25,006,987	24,598,575	3,783,705	3,600,067	28,849,655	28,275,970
Sows kept for Breeding	300,585	315,815	132,246	122,013	434,464	439,280
Other Pigs	2,013,748	2,263,269	1,153,043	1,083,236	3,181,437	3,355,841
TOTAL OF PIGS	2,314,331	2,579,084	1,290,289	1,205,249	3,615,891	3,795,131

⁶ Figures for Ireland include Orchards.

⁷ Furnished by the Department of Agriculture and Technical Instruction for Ireland.

⁸ Figures for Scotland relate only to Beans harvested as corn.

⁹ Figures for Scotland include Beans, Mashlum, &c., for Fodder.

¹⁰ Kohl-Rabi was not separately distinguished in Scotland or Ireland.

TABLE II.—Total Produce, Acreage, and Yield per Acre of
1916 and 1915, with the Average

Crops	Total Produce		Acreage		Yield per Acre		Average of the Ten Years 1906-1915
	1916	1915	1916	1915	1916	1915	
WHEAT.							
	Qrs.	Qrs.	Acres	Acres	Bush	Bush.	Bush.
England	6,657,781	8,293,269	1,862,211	2,121,519	28 60	31'27	31 99
Wales	177,627	171,472	49,997	48,651	28'42	28 20	27 73
Scotland	283,101	369,919	63,085	76,654	35'90	33 61	40 20
GREAT BRITAIN . .	7,118,509	8,834,660	1,975,293	2,246,824	28 83	31'46	32'15
Ireland	353,379	404,695	78,433	86,530	36 98	37'42	36 92
UNITED KINGDOM .	7,471,888	9,239,355	2,051,731	2,333,354	29'13	31'68	32 21
BARLEY¹.							
England	4,849,962	4,229,031	1,244,639	1,161,538	31'17	29'38	32 90
Wales	330,964	293,598	87,437	80,178	30 28	29'32	30 96
Scotland	647,169	623,131	169,739	149,346	30'50	33'65	35'72
GREAT BRITAIN . .	5,828,085	5,156,060	1,501,815	1,381,060	31 05	29'37	33 12
Ireland	784,479	706,184	150,063	141,586	41 82	39'90	42 67
UNITED KINGDOM .	6,612,564	5,862,244	1,651,878	1,522,646	32 03	30 80	34'04
OATS.							
England	9,412,818	9,501,696	1,862,489	1,888,540	40'43	40'25	40'85
Wales	998,175	885,211	222,172	199,479	35 94	35'50	35'43
Scotland	4,527,539	4,885,190	990,589	982,601	36 56	39'77	38 30
GREAT BRITAIN . .	14,938,532	15,272,097	3,075,250	3,070,610	38 88	39'79	39 69
Ireland	8,395,253	7,036,298	1,071,593	1,088,664	47 74	51'71	50 00
UNITED KINGDOM .	21,333,785	22,308,395	4,146,843	4,159,274	41'16	42 91	42 38
BEANS¹.							
England	858,835	891,098	227,612	256,635	30 19	27 78	29'86
Wales	3,542	3,501	974	1,030	29'09	27'46	27'49
Scotland	24,444	24,418	5,439	5,332	35 96	36'29	36 69
GREAT BRITAIN . .	886,821	919,017	234,025	263,037	30 32	27 95	30 04
Ireland	5,748	5,138	998	1,032	46 08	39 83	43'52
UNITED KINGDOM .	892,569	924,155	235,023	264,069	30 38	28 00	30 13
PEAS¹.							
England	259,011	293,266	84,847	97,929	24 42	24'37	26'27
Wales	1,091	980	419	336	20 83	22 86	23'13
Scotland	424	405	144	127	23 56	25'54	27'26
GREAT BRITAIN . .	260,526	294,651	85,410	98,392	24'40	24'36	26'26
Ireland	561	707	148	180	30'32	31'42	28 95
UNITED KINGDOM .	261,090	300,338	85,558	98,572	24 41	24'38	26 33

¹ The particulars for Ireland have been furnished by the Department of Agriculture and Technical Instruction for Ireland, and those for Scotland, by the Board of Agriculture for Scotland. No Produce Statistics are collected for the Channel Islands and the Isle of Man.

² Including Bero.

³ Excluding a certain area returned as picked or cut green amounting to 7,671 acres in England and Wales in 1916.

each of the Principal Crops in the United Kingdom¹ in of the Ten Years 1906-1915.

Crops—continued	Total Produce		Acreage		Yield per Acre		Average of the Ten Years 1906-1915
	1916	1915	1916	1915	1916	1915	
POTATOES.	Tons	Tons	Acres	Acres	Tons	Tons	Tons
England	2,870,085	2,702,181	309,588	438,040	593	618	624
Wales	194,421	165,932	28,962	26,459	474	589	538
Scotland	581,015	972,084	180,116	144,393	408	673	648
GREAT BRITAIN	3,035,531	3,830,177	558,064	607,792	544	630	628
Ireland	2,433,346	3,710,083	586,308	594,487	415	624	580
UNITED KINGDOM	5,468,877	7,540,240	1,144,372	1,202,259	478	627	577
TURNIPS AND SWEDES.⁵							
England	12,147,635	11,068,406	879,684	878,198	1331	1260	1299
Wales	837,753	738,651	52,682	50,753	1590	1456	1542
Scotland	5,896,768	7,532,792	414,313	420,995	1423	1789	1687
GREAT BRITAIN	18,882,154	19,340,049	1,346,679	1,349,944	1402	1433	1415
Ireland	4,485,911	5,091,034	262,814	285,122	1688	1920	1742
UNITED KINGDOM	23,318,065	24,431,083	1,609,493	1,615,066	1449	1513	1465
MANGOLD.⁵							
England	7,181,711	7,627,153	385,631	401,048	1951	1902	1932
Wales	205,987	208,927	11,319	11,461	1800	1805	1817
Scotland	44,333	55,570	2,356	2,503	1882	2220	1928
GREAT BRITAIN	7,382,011	7,889,650	379,306	415,012	1946	1901	1929
Ireland	1,637,834	1,806,849	80,434	83,728	2024	2184	1985
UNITED KINGDOM	9,009,845	9,696,499	459,740	497,740	1960	1948	1937
HAY from CLOVER, SAINFOIN, &c.							
England	2,647,113	2,080,215	1,531,615	1,372,922	3347	3090	2942
Wales	251,691	207,488	181,084	165,145	2780	2513	2570
Scotland	759,919	543,029	420,105	390,105	3818	2784	3160
GREAT BRITAIN	3,658,723	2,830,732	2,132,804	1,928,172	3352	2936	2956
Ireland	1,828,655	1,695,400	870,266	908,856	4203	3781	3770
UNITED KINGDOM	5,487,378	4,526,132	3,063,070	2,837,030	3595	3191	3202
HAY from PERMANENT GRASS.							
England	5,325,150	3,807,137	4,270,042	4,118,843	2494	1949	2129
Wales	613,636	491,897	555,646	532,786	2208	1847	2019
Scotland	274,929	222,245	159,226	154,655	3454	2874	2963
GREAT BRITAIN	6,213,715	4,521,279	4,985,214	4,806,284	2493	1981	2316
Ireland	3,496,777	3,401,312	1,535,981	1,587,071	4553	4286	4324
UNITED KINGDOM	9,710,492	7,922,591	6,521,195	6,393,355	2978	2478	2791
HOPS.							
England ⁶	Cwt. 307,856	Cwt. 254,609	31,352	34,744	982	733	805

⁴ Excluding a certain area returned as picked or cut green amounting to 27,417 acres in England and Wales and 447 acres in Scotland.

⁵ Excluding certain areas on which the crops were grown for the production of seed, amounting to 1,841 acres of turnips and swedes and 1,187 acres of mangolds in England and Wales in 1916.

⁶ No Hops are grown in any other part of the United Kingdom.

TABLE III.—*Estimated Total Production of Hops in the Years 1916 and 1915, with the Acreage and Estimated Average Yield per Statute Acre, in each County of England in which Hops were grown.*

COUNTIES, &c	Estimated total produce		Acreage returned on 4th June		Estimated average yield per acre	
	1916	1915	1916	1915	1916	1915
	Owt	Owt.	Acres	Acres	Owt	Owt.
East . . .	53,511	54,819	5,326	5,727	10 05	9 57
Mid. . . .	68,980	68,869	8,467	7,238	10 67	9 51
Kent Weald . .	73,598	65,648	7,706	8,370	9 55	7 84
Total, Kent	196,089	189,334	19,499	21,335	10 06	8 87
Hants	15,517	6,181	1,380	1,514	11 24	4 05
Hereford . . .	42,833	20,737	4,645	5 105	9 22	3 84
Surrey	3,562	1,628	326	552	8 36	2 95
Sussex	25 816	22,173	2,656	2,864	9 72	7 74
Worcester . . .	23,182	14,460	2,643	2,961	8 77	4 69
Other Counties ¹ .	857	137	103	113	8 32	1 21
Total	307,856	254,609	31,352	34,744	9 82	7 33

¹ Gloucester, Salop and Stafford.

TABLE IV.—*Average Prices of British Corn per Imperial Quarter in England and Wales, as ascertained under the Corn Returns Act, 1882, in each Week of the Year 1916.*

Week ended	Wheat	Barley	Oats	Week ended	Wheat	Barley	Oats
	s. d.	s. d.	s. d.		s. d.	s. d.	s. d.
January 2 . . .	55 8	47 8	31 5	July 8	46 3	45 6	30 8
January 15 . . .	56 7	48 6	31 11	July 15	48 11	47 5	31 6
January 22 . . .	57 2	49 6	32 6	July 22	51 6	48 8	32 3
January 29 . . .	58 0	51 0	32 11	July 29	53 5	47 2	32 5
February 5 . . .	58 3	52 5	32 1	August 5	55 1	46 1	32 9
February 12 . . .	57 6	51 10	32 2	August 12 . . .	56 7	46 11	31 2
February 19 . . .	56 11	53 6	31 9	August 19 . . .	58 1	48 0	30 8
February 26 . . .	58 2	54 2	32 2	August 26 . . .	59 0	47 1	31 6
March 4	59 4	55 7	32 1	September 2 . .	59 4	48 5	30 5
March 11	58 2	55 6	32 3	September 9 . .	59 3	51 7	31 1
March 18	57 9	55 4	31 10	September 16 . .	59 11	52 6	30 9
March 25	55 11	54 6	31 4	September 23 . .	58 4	53 3	30 9
April 1	53 6	53 8	30 5	September 30 . .	58 10	54 1	31 1
April 8	51 8	53 7	30 1	October 7	59 2	54 5	30 9
April 15	53 2	53 1	30 7	October 14 . . .	59 7	53 10	31 6
April 22	56 3	52 10	31 8	October 21 . . .	60 9	58 8	31 11
April 29	56 3	53 5	32 1	October 28 . . .	62 10	54 6	32 10
May 6	55 7	53 1	32 10	November 4 . . .	66 7	56 2	34 0
May 13	55 5	53 5	33 1	November 11 . .	69 8	58 0	35 8
May 20	55 0	52 10	33 0	November 18 . .	70 9	59 8	37 8
May 27	54 7	52 9	33 4	November 25 . .	70 8	61 8	39 7
June 3	53 3	53 9	33 3	December 2 . . .	71 3	63 1	41 4
June 10	51 2	52 8	32 7	December 9 . . .	72 1	65 6	44 1
June 17	48 10	50 9	32 1	December 16 . .	73 2	66 5	45 10
June 24	47 6	49 10	31 3	December 23 . .	74 8	67 3	46 5
July 1	46 3	49 1	30 10	December 30 . .	75 10	67 5	47 4
Average of year.					58 5	53 6	33 5

TABLE V.—Average Annual Prices per Quarter and Total Quantities of British Corn returned as sold in the Towns in England and Wales making Returns under the Corn Returns Act, 1882, in the Years 1912—1916.

Years	Wheat		Barley		Oats		Wheat		Barley		Oats	
	s.	d.	s.	d.	s.	d.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.
1912	34	9	30	8	21	6	2,365,596	2,165,572	630,775			
1913	31	8	27	3	19	1	2,511,297	2,948,980	639,298			
1914	34	11	27	2	20	11	3,027,976	3,403,072	1,164,361			
1915	52	10	37	4	30	2	3,225,198	2,552,128	1,181,480			
1916	58	5	53	6	33	5	3,600,391	2,182,218	1,129,096			

TABLE VI.—Annual and Septennial Average Prices per Bushel of British Corn in the Years 1912—1916, with the Value of £100 of Tithe Rent-charge.

Years	Annual average price			Septennial average price			Value of tithe rent-charge of £100											
	Wheat		Barley	Oats	Wheat		Barley	Oats	Calculated on annual average			Calculated on septennial average						
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	£	s.	d.	£	s.	d.		
1912	4	4	3	10	2	8½	4	0½	3	3	2	1	85	8	7	74	14	9½
1913	3	11½	3	4½	2	4½	4	1	3	3½	2	4½	76	3	6½	75	16	4
1914	4	4½	3	4½	2	7½	4	2	3	4½	2	4½	80	16	8½	77	1	4½
1915	6	7½	4	8	3	9½	4	6½	3	6½	2	7½	116	7	2½	83	2	6½
1916	7	3½	6	8½	4	2	4	11	4	0½	2	10½	141	8	9½	92	1	0½

TABLE VII.—Average Prices of British Wool in each Year from 1896 to 1916 inclusive.

Years	Leicester ¹		Half-bred ¹		Southdown ¹		Lincoln ²	
	Per lb.		Per lb.		Per lb.		Per lb.	
	d.	d.	d.	d.	d.	d.	d.	d.
1896	9½ to 11		9½ to 10½		9½ to 11½		11½	
1897	8½ " 10		8½ " 9½		8½ " 10½		9½	
1898	8 " 8½		7½ " 8½		8½ " 9½		8½	
1899	7 " 8		7 " 8½		7½ " 11		8½	
1900	6½ " 7½		6½ " 8½		8 " 12		7½	
1901	5½ " 6		5½ " 9½		7½ " 9½		6½	
1902	5 " 5½		5½ " 6½		7½ " 9½		6½	
1903	6½ " 6½		7½ " 8		8½ " 11½		7½	
1904	8½ " 9½		9½ " 10½		9½ " 11½		10½	
1905	11½ " 12		11½ " 12½		11½ " 13½		12½	
1906	12½ " 13		13½ " 14½		14½ " 15½		14½	
1907	12½ " 12½		12½ " 13½		13½ " 15		12½	
1908	8½ " 8½		8½ " 10		11½ " 12½		8½	
1909	8½ " 8½		10 " 11½		12½ " 13½		8½	
1910	9½ " 9½		11½ " 12½		14 " 15		9½	
1911	9½ " 10½		11½ " 12½		18½ " 14½		9½	
1912	9½ " 10½		11½ " 12		18½ " 14½		10½	
1913	11½ " 12½		13½ " 13½		14½ " 15½		12½	
1914	12½ " 12½		13½ " 14½		15½ " 16½		12½	
1915	17½ " 18½		19½ " 19½		20½ " 21½		17½	
1916			21½ " 22½		23½ " 24½		19½	

¹ Computed from the prices given in *The Economist* newspaper.

² Extracted from "*The Yorkshire Daily Observer Wool Tables*."

TABLE VIII.—*Yearly Average Prices of Fat Stock and Milking Cows in England and Wales during the Years 1907 to 1916.*

(Compiled from the Weekly Return of Market Prices)

DESCRIPTION	Quality	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916
FAT CATTLE		per stone s d	per stone s d	per stone s d	per stone s d	per stone s d	per stone s d	per stone s d	per stone s d	per stone s d	per stone s d
Polled Scots	1	7 11	8 2	8 5	8 9	8 5	9 3	9 3	9 4	11 10	13 11
	2	7 7	7 9	7 11	8 3	7 11	8 8	8 9	8 11	11 2	13 3
Shorthorns	1	7 10	7 11	8 2	8 7	8 2	9 0	9 0	9 2	11 9	13 8
	2	7 2	7 3	7 5	7 9	7 5	8 1	8 3	8 5	10 9	12 6
Herefords	1	8 0	8 1	8 5	8 9	8 5	9 2	9 3	9 3	11 10	13 9
	2	7 5	7 7	7 8	8 1	7 8	8 5	8 7	8 8	10 8	12 7
Devons	1	8 2	8 3	8 5	8 9	8 4	9 0	9 2	9 2	11 11	13 7
	2	7 6	7 6	7 9	7 11	7 7	8 1	8 3	8 5	10 10	12 1
MILKING COWS		per head s s	per head s s	per head s s	per head s s	per head s s	per head s s	per head s s	per head s s	per head s s	per head s s
Shorthorns—											
In Milk	1	21 1	21 5	21 7	23 3	22 2	22 1	23 15	23 13	26 6	34 5
	2	17 17	18 2	17 18	18 9	18 7	18 8	19 15	19 15	21 14	27 10
Calvers	1	20 14	21 4	21 0	21 11	21 11	21 18	22 16	22 9	24 18	32 19
	2	17 11	18 2	17 16	18 5	18 0	18 2	19 4	18 19	20 15	26 13
Other Breeds—											
In Milk	1	19 15	19 1	18 13	19 12	19 2	19 2	20 16	21 0	24 4	31 8
	2	14 16	15 0	14 12	15 14	16 6	16 2	17 13	17 14	19 16	25 7
Calvers	1	14 5	14 8	14 11	16 1	14 12	16 9	18 9	17 4	19 0	24 1
	2	13 0	12 17	13 2	12 19	12 17	13 6	14 13	15 8	17 13	21 15
VEAL CALVES		per lb d	per lb d	per lb d	per lb d	per lb d	per lb d	per lb d	per lb d	per lb d	per lb d
	1	8	8½	8½	8½	8½	8½	9½	9½	10½	12½
	2	7½	7½	7½	7½	7½	7½	8½	8½	9½	11
FAT SHEEP											
Downs	1	9	8½	7½	8½	7½	8½	9½	9½	11	13½
	2	8½	7½	6½	7½	7	8	8½	8½	10	12
Longwools	1	8½	7½	6½	7½	7½	8½	9	9½	10½	12½
	2	7½	7	6	6½	6½	7½	8	8½	9½	11½
Crossbred	1	9	8½	7½	8½	7½	8½	9½	9½	11	13½
	2	8½	7½	6½	7½	7	7½	8½	8½	10	12
FAT PIGS		per stone s d	per stone s d	per stone s d	per stone s d	per stone s d	per stone s d	per stone s d	per stone s d	per stone s d	per stone s d
Bacon Pigs	1	6 8	6 2	7 1	7 10	6 8	7 4	8 5	7 10	9 7	12 4
	2	6 3	5 8	6 7	7 5	6 2	6 10	7 11	7 4	9 0	11 7
Porkers	1	7 2	6 7	7 6	8 4	7 3	7 8	8 11	8 4	10 0	13 2
	2	6 3	6 2	7 0	7 10	6 9	7 2	8 4	7 11	9 6	12 6

TABLE IX.—*Quantities and Values of Imports of the principal Agricultural Commodities into the United Kingdom in the years 1915 and 1916, with the average for the years 1911 to 1913.*

Commodities	Quantities			Values		
	Annual average 1911-13	1915	1916	Annual average 1911-13	1915	1916
GRAIN AND MEAL						
	Cwt.	Cwt.	Cwt.	£	£	£
Wheat	104,508,143	88,687,900	100,088,520	43,068,074	57,306,499	72,011,375
Wheat meal and flour	10,774,254	10,842,170	9,980,333	5,714,439	8,310,853	8,568,134
Barley	22,370,321	12,291,685	15,323,700	8,071,609	6,029,866	10,413,138
Oats	18,245,367	15,640,100	12,002,600	5,800,459	8,488,539	6,597,577
Oatmeal, including groats & rolled oats	845,693	890,481	973,333	602,913	878,686	986,855
Peas	2,249,705	1,090,953	991,121	1,103,733	872,407	1,290,024
Beans (other than Haricot)	1,275,416	1,142,810	1,116,725	471,456	534,139	690,732
Maize	43,878,207	48,581,300	34,154,210	12,692,064	18,901,825	19,896,157
Maize meal	581,982	247,396	418,643	215,885	112,571	246,713
MEAT						
Beef	8,879,065	10,447,455	8,733,459	15,964,027	36,358,843	32,684,353
Mutton	5,358,482	4,767,289	3,679,789	10,331,026	14,113,041	13,689,044
Pork (including Bacon and Hams)	6,340,225	8,330,032	9,325,602	19,781,848	31,372,050	42,527,743
Unenumerated (including Rabbits)	1,493,563	1,681,254	1,603,842	3,034,851	3,967,300	4,488,890
Total Dead Meat	22,076,349	25,276,030	23,347,692	49,112,752	86,151,234	93,890,030
Butter	4,148,958	3,853,855	2,178,029	24,679,478	27,022,745	18,977,450
Cheese	2,318,231	2,726,536	2,804,027	7,196,490	11,107,100	12,945,450
Milk, Condensed	1,209,964	1,577,522	1,709,919	2,141,134	3,357,904	5,725,404
Eggs	No. of Gt. Hun. 19,907,633	No. of Gt. Hun. 10,246,026	No. of Gt. Hun. 6,606,411	8,620,894	6,123,328	4,741,401

[Continued from page 108]

The restoration in 1916 of a portion of the large area which had been withdrawn from Barley in the previous year, coupled with a slight improvement in the yield per acre in Great Britain as a whole, resulted in a total production of 5,828,000 quarters. Although this figure represents an advance of 672,000 quarters (13 per cent.) on 1915, it by no means makes up for the reduction of 27 per cent. which occurred in that year, and the production in 1916 was 1,000,000 quarters (15 per cent.) below the average 1910-14. In England the yield per acre improved by $1\frac{1}{2}$ bushels over 1915, but still remained below average, whereas in Scotland the yield was over 3 bushels worse than in the previous year, and at $30\frac{1}{2}$ bushels became the lowest yield on record for that country, and was 5 bushels (15 per cent.) below the ten-year average.

Despite the slight increase in acreage the production of Oats in Great Britain in 1916 showed a decline of 334,000 quarters on that of the year before. This was due mainly to the very disappointing crop in Scotland, the yield there being 3 bushels below 1915, and $1\frac{3}{4}$ below the ten-year average, and was the worst for ten years. In England and Wales the yield per acre remained practically level with both 1915 and the ten-year average, and the total production changed principally in accordance with the altered acreage, the gain in Wales more than counterbalancing the deficiency in England. The oat crop in Great Britain as a whole, thanks to the maintenance of the 1915 increase in the acreage, was about 700,000 quarters heavier than the average production in 1910-14.

Although the yield of Beans harvested in Great Britain recovered by nearly $2\frac{1}{2}$ bushels from the poor results of 1915, and was about average, the reduced acreage resulted in a net drop of 32,200 quarters. This figure represents also the change in England by itself, Scotland and Wales showing practically the same production as before. The production in England was the smallest since 1904, and was 220,000 quarters (20 per cent.) below 1914.

Peas are practically confined to England, where the yield remained almost as low as in 1915, and was nearly 2 bushels below average. Of the total 112,000 acres planted in England in 1916, 27,000 acres, *i.e.*, a fourth (about the same proportion as in 1915) were picked or cut green, leaving some 85,000 acres for harvesting, which was 13,000 acres less than in 1915. Taken in conjunction with the continued low yield this gave a total crop of nearly 40,000 quarters less than in the previous year, and marked a further stage in the steady shrinkage that has taken place in peas in recent years, the 1916 crop being as a matter of fact only one half that of the average of ten years ago.

The weight of Potatoes grown in 1916 was 795,000 tons (20 per cent.) less than in 1915 and 1,000,000 tons less than the record crop of 1914. As compared with the average of the five years preceding the war it showed a fall of 640,000 tons. This unfortunate result with a crop of such importance in war time was due partly of course to the reduced acreage, but it was greatly enhanced by the poor yield per acre, which in Scotland was nearly $2\frac{1}{2}$ tons, and in England a third of a ton, below the average—the same comparisons holding good with 1915, which was about average. Although limitation of space confines this review to Great Britain, in the case of potatoes, where such a large proportion of the crop is produced in Ireland, it is important to note that the crop in 1916 in that country was also very deficient, being nearly 1,277,000 tons below 1915, and over 800,000 tons below the average of 1910-14. As a result, supplies

of potatoes in the United Kingdom from the 1916 crop were over 2,000,000 tons (27 per cent.) less than from that of 1915.

Turnips and Swedes in Great Britain as a whole were slightly below the average yield. Being, moreover, about one-third of a ton below 1915, there was a decline (459,000 tons, or 2 per cent.) in the total production, although the acreage remained about the same. The total crop of 18,882,000 tons was about 1,570,000 tons (7 per cent.) below the average of the five years before the war. In both England and Wales it will be noticed that the yield per acre was above average, but this was outweighed by the yield in Scotland being over $3\frac{1}{2}$ tons below 1915, and $2\frac{1}{2}$ below average, with the result that the gain of 1,200,000 tons in England and Wales was nullified by a decline of 1,600,000 tons in Scotland.

The yield of Mangold in 1916 was just over average, and about one-half of a ton above the under-average yield of 1915. The reduction in acreage, however, resulted in the total production in England and Wales (very little of this crop is grown in Scotland) being 500,000 tons (6 per cent.) less than the previous year. The mangold crop had not been so small for twelve years, and was nearly 600,000 tons below the average of the five years 1911-15.

Hay proved to be an excellent crop in 1916, the yield from clover and rotation grasses being 4 cwt. per acre above the decennial average, and the best since 1898. In Scotland the remarkable result of 36.18 cwt. was obtained, which was $8\frac{1}{2}$ cwt. (30 per cent.) above the poor yield of 1915. The high yields, together with the increase of 240,000 acres in the area mown, resulted in the crop of "Seeds" Hay in Great Britain as a whole being over 800,000 tons (28 per cent.) greater than in 1915. Meadow hay, although not doing so remarkably well as the other variety, gave a very satisfactory yield of about $1\frac{1}{2}$ cwt. above average, and provided a great contrast to the failure of 1915, the difference in the two years being over 6 cwt. (33 per cent.) per acre. The total area of permanent pasture reserved for mowing was increased by 180,000 acres, of which 170,000 were in England alone. As a result of the satisfactory yield and larger acreage mown the production of meadow hay in Great Britain amounted to 1,690,000 tons more than in 1915. Taking seeds and meadow hay together, the total production of hay in Great Britain in 1916 was 9,872,438 tons, as compared with 7,352,011 tons in the previous year, thus showing an increase of 2,520,000 tons (34 per cent.) over that year, and being 1,500,000 tons above the average production of the preceding ten years.

The area under Hops in 1916 showed a reduction of 3,400 acres (10 per cent.) over 1915, and was the smallest since the

returns were first collected. Owing, however, to an improvement of $2\frac{1}{2}$ cwt. in the yield—the results of picking coming at $\frac{3}{4}$ cwt. over average in contrast to the failure of the previous season—the total production increased by over 53,000 cwt. compared with 1915, but was nevertheless about 34,000 cwt. below the average in 1906-15.

PRICES IN ENGLAND AND WALES.

Corn.—(Tables IV, and V.). The price of British Wheat remained very steady during the first five months of 1916, but after a drop in the summer (when, however, the quantities remaining for sale were very small) a heavy rise set in as soon as the new crop was available, the price increasing from 59s. per quarter at the end of August to 75s. 10d. in the last week of December. The record prices of the close of the year did not, however, raise the average for the year as a whole to more than a shilling or two above the prices ruling in January, although the difference between the first and last weeks of the year was over 20s. per quarter. At 58s. 5d. the yearly average came out at 5s. 7d. above that of 1915, and nearly 26s. above the average of the pre-war years, 1911-13.

Barley did not open so steadily as wheat, the price by the commencement of March being 8s. per quarter above that in the first week of January. With this cereal also, a considerable rise took place when the new crop reached the market. The rise did not become pronounced until the end of October, after which 13s. per quarter were added before Christmas was reached, and, as in the case of wheat, the price at the close of the year was 20s. above that in January. The average for the year was 53s. 6d., being as much as 16s. 2d. above that for 1915, and 25s. (or 80 per cent.) above that in 1911-13.

The prices for home-grown Oats in 1916 showed very little variation until the last two months of the year, when they became subject to the general rise in corn prices which took place then. Between the last week in October and the end of the year oats advanced by 14s. 6d. per quarter, the closing price being as high as 47s. 4d. The yearly average (33s. 5d.), owing to the prices for the first ten months being only a shilling or two above those ruling in 1915, was only 3s. 3d. above the average for that year, although coming out at over 13s. above the average of 20s. per quarter in 1911-13.

The high prices of corn in both 1915 and 1916 are strongly reflected in the value of tithe-rent based on the septennial average (Table VI.), the value per nominal 100l. being now 92l. 1s. 0 $\frac{1}{4}$ d., which is the highest value since 1884, and represents an increase of 8l. 18s. 5 $\frac{1}{2}$ d. over last year, and of 17l. 12s. 7d. (nearly 25 per cent.) over the average during 1911-13.

Live Stock.—(Table VIII.). The advances obtained in live stock prices in 1915 were carried much farther in 1916, all classes of beasts fetching considerably more money. In the case of Fat Cattle the average prices were about 1s. 11d. per stone above those in 1915, the largest increase being 2s. 1d. for Polled Scots. Compared with the pre-war years 1911-13 the 1916 prices showed an advance of 4s. 10d. per stone.

Milking Cows had a particularly noticeable advance, being as much as 6l. 2s. per head more than in 1915, the rise in the case of first quality Shorthorns being as much as 8l., or 30 per cent. The average advance over 1911-13 was 9l. 11s.

Veal Calves ruled at 1½d. to 1¾d. per lb. above 1915 and about 3d. above 1911-13.

Prices for **Fat Sheep** increased by 2d. per lb., the rise over 1911-13 being about 4d. **Pigs** advanced by 3s. per stone, the rise for **Bacon Pigs** being 2s. 8d. compared with 1915 and 4s. 8d. compared with 1911-13. **Porkers** averaged 3s. per stone over 1915 and 5s. (nearly 33 per cent.) above 1911-13.

Wool.—The 1916 wool clip was commandeered by the War Office, payment being based on an increase of 35 per cent. on the 1914 price. Consequently the quotations for British wool marketed in 1916 (Table VII.) refer only to the stocks of the 1915 or earlier clips remaining unsold until 1916. The unsold stocks, being relatively small, commanded a good price and an advance of 2d. to 3d. per lb. over prices paid in 1915 was obtained.

IMPORTS.

(a) Quantities.

In view of the shortage of freight and the increased requirements of certain of our Allies, the quantity of agricultural produce reaching this country in 1916 (Table IX.) can on the whole be regarded as very satisfactory. The only serious reductions were in maize, butter and eggs, against which imports of wheat, barley and pork were much heavier than in the previous year. The imports of **Wheat** increased by over 11,000,000 cwt., compared with 1915 and were only 4,500,000 cwt. (4 per cent.) below the average of the pre-war years 1911-13. Of the total 100,000,000 cwt. imported, no less than 64,500,000 cwt. were received from the United States. This immense quantity is the largest amount ever received in any one year from that country, and is nearly three times as much as the average for the years 1911-13. The supplies from Canada in 1916 amounted to 21,500,000 cwt., a gain of nearly 2,000,000 cwt. over the previous year; the quantity being about the same as in 1912 and 1913. Supplies from Australia, the almost complete absence of which in 1915 had a serious effect on our total

supplies, reached 3,700,000 cwt. in 1916, but this was a very short supply compared with the average annual supply of 12,000,000 cwt. in 1911-13. From the Argentine only 4,500,000 cwt. were received as against over 12,000,000 cwt. in 1915, and an average for 1911-13 of 16,000,000 cwt. Supplies from India were also very deficient, only 5,600,000 cwt. being received, as compared with 14,000,000 in 1915, and an average of 20,000,000 cwt. in 1911-13. Russia, which in the three years immediately preceding the war exported an average of 11,000,000 cwt. of wheat per annum to the United Kingdom, was in 1916 unable to ship more than the insignificant amount of 12,000 cwt. Arrivals of Flour showed a drop of half a million cwt. below 1915. The principal sources of the imported flour supply are Canada and the United States, who between them furnish 90 per cent. of the total. Canadian supplies in 1916 amounted to 4,250,000 cwt., an increase of 1,000,000 cwt. over 1915, and were the largest quantity ever sent. Shipments from the United States, however, fell from 6,750,000 cwt. in 1915 to less than 5,200,000 cwt. in 1916.

The total imports of wheat and flour (in the equivalent weight of grain) in 1916 were over 114,000,000 cwt., an increase of 13,000,000 cwt. over 1915, but 15,000,000 cwt. below the average for the pre-war years 1911-13.

The great decline in Barley imports in 1915 was slightly made up in 1916, supplies increasing by 3,500,000 cwt., although still being about 7,000,000 cwt. below pre-war average. The increase in 1916 was entirely owing to supplies from the United States reaching the record figure of 9,000,000 cwt., as compared with an average of about 3,000,000 cwt. in 1911-13. The deficiency in barley supplies is, of course, mainly owing to the absence of the normal consignments from Russia, which in 1911-13 averaged about 5,000,000 cwt. From each of the other two principal sources of our barley supplies, Canada and India, we received over 2,800,000 cwt.

Oats showed a further decline in 1916, supplies being 3,000,000 cwt. below the previous year, and 6,000,000 cwt. below pre-war average. Here again the absence of supplies from Russia was largely responsible for the shortage, and in the case of this cereal, we were accustomed to rely upon Germany to the extent of 2,000,000 or 3,000,000 cwt. per annum.

Peas showed a further shortage, supplies in 1916 being less than half the normal. In view of the general difficulty in obtaining sufficient supplies of feeding stuffs the decline of Maize imports in 1916 to 34,000,000 cwt. is serious, this quantity being 10,000,000 cwt. below the normal supply. The reduction in the supplies from the Argentine was largely

responsible for the shortage, there being only 20,800,000 cwt. received from that country, as compared with 28,800,000 cwt. in 1912, 39,000,000 cwt. in 1913, and 29,000,000 cwt. in 1914. The cutting off of Russian and Roumanian supplies, also made a considerable difference to the total receipts.

Meat.—The total imports of Meat in 1916, although declining by 2,000,000 cwt. compared with the previous year, were over 1,000,000 cwt. above the average of 1911-13. Beef supplies fell off by 1,700,000 cwt. compared with 1915, but were nearly 550,000 cwt. (nearly 7 per cent.) above 1911-13. Of the total quantity of beef received, 1,870,000 cwt. were *chilled* (mostly from Argentina), and 5,180,000 cwt. *frozen*, of which 2,760,000 cwt. (600,000 cwt. less than in 1915) came from the Argentine, 760,000 cwt. from Australia, 870,000 cwt. from New Zealand, and 540,000 cwt. from the United States of America. Oversea supplies of Mutton in 1916 were 1,000,000 cwt. less than in 1915, and 1,600,000 cwt. below 1911-13. The quantity sent from New Zealand, which provided over 60 per cent. of the total, was fairly normal, the deficiency being principally owing to the falling off in supplies from Australia, only 260,000 cwt. being received from the Commonwealth as compared with over 1,300,000 cwt. in 1914, and 1,250,000 cwt. in 1915. From the other chief source of frozen mutton supplies, Argentina, the quantity received in 1916—770,000 cwt.—was about the same as in 1915, but was 400,000 cwt. below 1914.

Unlike beef and mutton, imports of pig-meat in 1916 showed an increase, shipments being 1,000,000 cwt. heavier than in 1915, and 3,000,000 cwt. above 1911-13. Of the total quantity received, the greater proportion was in the form of Bacon, of which 7,400,000 cwt. were received, an increase of nearly 1,000,000 cwt. over 1915, and 2,700,000 cwt. (57 per cent.) over 1911-13. The greater part of the increase was due to the large supplies from the United States of America, the 4,000,000 cwt. received from that country in 1916, being more than double the pre-war supply. Canadian supplies also increased, 1,590,000 cwt. being sent, as against 416,000 cwt. per annum in 1911-13. On the other hand Danish supplies fell from an average of 2,259,000 cwt. in 1911-13 to 1,640,000 cwt. in 1916. The total weight of Hams imported into the United Kingdom in 1916 was 1,550,000 cwt., practically all of which came from the United States, an increase of 727,000 cwt. over 1911-13. The considerable supplies of fresh pork which were regularly received from Holland before the war dwindled from an average of 300,000 cwt. in 1911-13 to 138,000 cwt. in 1915 and to practically none in 1916, when only 800 cwt. arrived. Similarly no Danish salted pork was received in 1916, although during 1911-13 we received an average supply of about

180,000 cwt. The United States have developed a trade in frozen pork during the last two years, having sent to the United Kingdom 86,000 cwt. in 1915 and 250,000 cwt. in 1916.

Butter imports showed a serious decline in 1916, only 2,170,000 cwt. being received as against an average of 4,150,000 cwt. per annum in 1911-13. The German blockade of the Baltic was, of course, largely responsible for the deficiency, the quantities coming from Russia and Sweden being practically negligible, instead of the respective 700,000 and 300,000 cwt. usually received from those countries, and Danish supplies fell from the usual 1,700,000 cwt. to only 1,100,000 cwt. in 1916. Apart from this shortage the supplies from Australia were only 140,000 cwt., *i.e.* a fourth of the annual supply in 1911-13. In connection with the reduced butter imports it is significant to note that imports of margarine in 1916 amounted to 2,750,000 cwt. as against an average of only 1,200,000 cwt. per annum in 1911-13.

Imports of Cheese in 1916, although slightly below those of 1915, were well above the pre-war average, the reduction in Dutch supplies (112,000 cwt. against 240,000 cwt. before the war) being more than counterbalanced by increased supplies from Canada (1,500,000 cwt. against 1,360,000 cwt.), New Zealand and the United States of America.

The increase in oversea supplies of Condensed Milk in 1915 was followed by a further increase of 130,000 cwt. in 1916, the supplies for that year being half a million cwt. (41 per cent.) above the average in 1911-13.

Supplies of imported Eggs were still further reduced in 1916, the number received being less than one-third of the pre-war average. Russia, which, in spite of the war conditions, managed to send 3,000,000 great hundreds in 1915 (although sending 10,000,000 great hundreds in normal years), sent only 735,000 great hundreds in 1916. Danish supplies were also very deficient, being only 1,400,000 great hundreds against nearly 4,000,000 great hundreds per annum in 1911-13. As some counter-balance against the falling-off in our customary sources of supply, Canada, which before the war was practically unknown in the British egg market, followed up the 360,000 and 910,000 great hundreds sent in 1914 and 1915 respectively, by sending 1,430,000 great hundreds in 1916. From Egypt supplies improved from 800,000 great hundreds per annum in 1911-13 to 1,890,000 great hundreds in 1916.

(b) Values.

Although space precludes an adequate review of agricultural imports from the point of view of monetary value, it may be useful to draw attention to a few points of special interest.

In spite of the reduced supplies of certain commodities, it is an eloquent commentary on the deficiency of our home supplies that in 1916 our agricultural imports (as detailed in Table IX.) cost us nearly 260,000,000*l.*, of which 90,000,000*l.* may be said to be a special war tax, as the expenditure in 1911-13 averaged only 170,000,000*l.* Nearly one-third of the expenditure was on Wheat and Wheat Flour, 50,000,000*l.* under this head going to the U.S.A. alone, and 19,000,000*l.* of the remainder to Canada. 4,000,000*l.* more was spent on foreign and colonial Barley than in 1915, but for the total sum of 10,400,000*l.* (of which 5,800,000*l.* went to the U.S.A.) only three-fourths of the average pre-war weight was received, although the cost in those days was 2,000,000*l.* less. Although the expenditure on Oats was reduced by nearly 2,000,000*l.* compared with 1915, the value in 1916 exceeded that before the war by 800,000*l.* despite the supply being a third less. Compared with 1911-13 the average value (*i.e.* declared value at port of landing) per imperial quarter rose in the case of wheat from 35*s.* 3*d.* to 55*s.* 5*d.* in 1915 and 58*s.* 7*d.* in 1916; in that of barley from 25*s.* 11*d.* to 35*s.* in 1915, and 53*s.* 7*d.* in 1916, and in that of oats from 17*s.* 9*d.* before the war to 30*s.* 3*d.* in 1915 and 33*s.* 6*d.* in 1916. Notwithstanding the heavy reduction of nearly 30 per cent. in supplies of Maize compared with 1915, the value in 1916 rose by 1,000,000*l.* The disproportionate increase in the total value was due to the fact that the average cost was half as much again as in 1915, the declared value per cwt. working out at 11*s.* 8*d.* in 1916 as against 7*s.* 9*d.* in 1915 and 5*s.* 9*d.* in 1911-13.

7,000,000*l.* more was spent on foreign and colonial Meat in 1916 than in the previous year, although the weight received fell off by 2,000,000 cwt., and compared with the pre-war years 1911-13 it will be noticed that although only an additional 1½ million cwt. were received in 1916 the total cost rose by 44,000,000*l.*, *i.e.* it became nearly double. The increase in the value, however, had to a great extent taken place in 1915, beef having advanced from 33*s.* per cwt. in 1911-13 to 72*s.* in 1915, and only 3*s.* more in 1916. Mutton rose from 40*s.* per cwt. in 1911-13 to 60*s.* in 1915, and by a further 14*s.* in 1916. Pork, from 62*s.* per cwt. before the war, became 76*s.* in 1915, but in this case an equally great advance took place in 1916, in which year a further 15*s.* per cwt. were added.

The great drop in Butter imports was naturally reflected in the total value which was 8,000,000*l.* less in 1916 than in 1915, although the average value per cwt., which had been 5*l.* 17*s.* in 1911-13 and 7*l.* in 1915, rose to 8*l.* 14*s.* in 1916. Imported Cheese in 1916 cost nearly 6,000,000*l.* more than in 1911-13,

although the quantity received was only about $\frac{1}{8}$ more. The average value per cwt. rose from 62s. in 1911-13 to 82s. in 1915 and 99s. in 1916. The heaviest proportionate increase in the total value of agricultural imports in 1916 was in the case of Condensed Milk, on which the expenditure compared with 1915 increased by 2,400,000l. (or 70 per cent.), and was two and a third times as much as the average in 1911-13. Not only did the total quantity received increase by 40 per cent. compared with 1911-13, but the average value rose from 35s. per cwt. in that period to 42s. 3d. in 1915 and to 67s. in 1916. By contrast, the amount spent on imported Eggs in 1916 was little more than half that in normal years. The net saving on eggs, however, was due entirely to the great shortage in supplies, the average cost per great hundred having risen from 9s. in 1911-13 to 12s. in 1915 and by a further 2s. in 1916.

In view of the particularly heavy cost incurred in war time by the necessity of having to import a large proportion of our food supplies it may be of interest to point out in conclusion that of the 120,000,000l. spent on oversea supplies of the various kinds of grain and meal in 1916, 33,000,000l. went to British possessions and of the balance, 63,000,000l. went to the United States of America, and 18,000,000l. to Argentina. Of the total 93,000,000l. spent on meat, 23,000,000l. went to other parts of the Empire, 29,000,000l. to the United States of America, and 17,000,000l. to Argentina (excluding in each case canned and tinned meat, for which over 10,000,000l. is included in the total imports, but for which details have not yet been published). Of the total expenditure of 37,000,000l. on imported butter, cheese, and eggs, 18,000,000l. was in respect of colonial produce, and in the case of condensed milk the whole sum was credited to foreign countries.

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THE WEATHER OF THE PAST AGRICULTURAL YEAR.

THE agricultural season of 1916 opened, favourably enough, with a dry autumn, and for a time farm work of all kinds was subject to little interruption. The unusually cold weather of November, 1915, interfered greatly, however, with sowing and all other operations which had been delayed earlier in the season, and an exceedingly wet winter afforded little opportunity for making up any lost time. Further interruptions

resulted from the wintry weather and heavy storms of wind, rain, and snow which occurred at the close of the winter, and as late even as the end of March. The spring was upon the whole fairly propitious, although sharp night frosts again worked (as in so many recent years) sad havoc in the gardens and orchards, much of the fruit blossom being irretrievably damaged. The earlier half of the summer was unusually cold and inclement, so that the growth of vegetation was slow, but the hay harvest proved a bountiful one and the cereal crops seemed to flourish fairly well, in spite of the many adverse influences they had previously undergone. Three or four weeks of warm dry weather between July and August worked wonders, and in the south an early harvest was conducted under highly advantageous conditions, the unsettled weather which set in later being favourable also for the progress of the root crops. By the close of the season the farmers' balance sheet was in fact more satisfactory than could possibly have been expected at an earlier period of the year, the most unsatisfactory crop being perhaps the hops, which were affected by the rarity of warm sunshine and the consequent attacks of red mould. In all the more western and southern districts the autumn of 1916 proved so wet that seeding and farm work of all descriptions was seriously delayed, and at the end of the year the agricultural outlook was unhappily much less favourable than the prospects afforded a twelvemonth earlier.

THE WINTER OF 1915-16.

December, 1915, the opening month of the winter season, was mild, stormy, and exceedingly wet. On many occasions the thermometer in the shade rose appreciably above 55°, the warmest spells occurring about the 4th, the 27th, and the 31st. In the second week a brief touch of wintry weather was experienced, and between the 12th and 14th a severe frost occurred in some parts of the midlands and north of England, the sheltered thermometer falling early on the 13th to a minimum of 15° at Burnley and 18° at Leyland. Another cold snap was reported locally in the midlands between the 18th and 20th, a reading of 18° being registered at Wellington, Shropshire, on the 19th. The earlier touch of frost was preceded in many districts by substantial falls of snow. At Meltham on the 9th, at Harrogate on the 10th, and at Carnforth on the 11th, snow lay on the ground to a depth of about 4 in. Throughout nearly the whole of December heavy falls of rain were of frequent occurrence. Instances of more than an inch in 24 hours were recorded in several places on the 4th and 5th, in Devonshire and around Snowdon on the 9th, over southern England generally on the 14th, along the south coast on the

23rd, and again on the 26th, and in many western districts on the 27th, and again on the 31st. During the heavy fall which visited our southern counties on the 14th, as much as 1·9 in. of rain was collected at Dorchester, Falmouth and Redruth, 2·0 in. at Tavistock and (in the Dartmoor region) 3·1 in. at Sheepstor and 3·9 in. at Princetown. The worst of the December gales occurred on the 27th, when the South-Westerly wind blew with great violence, more especially in South Wales and the south west of England, where much damage was done to buildings, trees, and telegraph wires; in the neighbourhood of Lampeter no fewer than 1,000 trees are said to have been blown down.

January was less stormy and far drier than December, but the air remained very mild, and in many parts of the country the mean temperature of the month was the highest recorded for at least 40 years past. New Year's day proved quite phenomenal, the thermometer rising well above 55° in nearly all districts, and touching 60° at Bude and Wistanstow. A little later, on the 5th or 6th, a touch of unusual warmth was experienced in North Wales, the thermometer in the shade touching 62° at Colwyn Bay and 63° at Rhyl. Almost the only indication of wintry weather occurred about the 22nd and 23rd, when a sharp frost was reported in some of the more central districts. Gales and heavy falls of rain were rare, but in the course of a severe storm which swept over from the South-Westward on January 1 the wind at Southport blew in gusts with a velocity of 85 miles per hour, and considerable quantities of rain were experienced at several places in the north of England.

Unusually mild weather continued to prevail throughout the earlier half of February, the highest temperatures occurring around the 5th or 6th, or between the 13th and 16th. On the 3rd and 4th a heavy gale from South-West passed across the south of England, and on the former day large quantities of rain were experienced in Devon and Cornwall, as much as 2·8 in. at Princetown, 2·2 in. at Sheepstor, 2·1 in. at Falmouth and 1·8 in. at Ashburton and Redruth. A severe gale from South-West and afterwards from North-West swept over the whole country on the 15th and 16th, the wind rising in gusts to a velocity of 76 miles per hour at South Shields and Shoeburyness, to 81 miles per hour at Southport, and to 87 miles per hour at Holyhead. With the shift of wind to North-West the character of the weather changed completely, and in the closing week of February winter made its long delayed appearance. The greatest cold occurred between the 24th and 26th, when the thermometer at many places in the east and south-east of England failed to reach the freezing point all day. Early on the 25th the minimum thermometer in the screen registered at least 10 or 12 degrees of frost, a reading as low as 15° being

observed at Tunbridge Wells, 16° at Benson (Oxon.) and 17° at Ardingly (Sussex). Heavy snowstorms were experienced at about the same time in nearly all districts, and by the 26th a depth of 10 in to a foot was reported quite commonly in level situations.

The cold weather came too late to have much influence upon the winter mean temperature, which was everywhere considerably above the average. Rainfall also showed a large excess, but was not so heavy as in the phenomenally wet winter of 1914-15. In nearly all districts the total amount was, however, at least half as much again as the average, while in the south-east of England the excess amounted to 90 per cent., nearly double the average. Bright sunshine was rather above the normal in the north-eastern counties, but below it elsewhere, and considerably below it in the south-west of England and the Channel Islands, where the winter was the duller since that of 1903-4.

THE SPRING OF 1916.

The arbitrary division of the year for meteorological purposes into four seasons, each consisting of three calendar months, is in many ways convenient, but is at the same time open to serious objection. Numerous instances occur in which the elements fail to recognise any such arbitrary limits, and as a result the weather proper to one particular quarter of the year becomes associated with a season to which, under normal conditions, it could scarcely be said to belong.

A notable instance of this occurred last year. The sharp wintry weather which should have appeared in December or January did not, as we have already seen, set in until after the middle of February, and with a fine disregard for recognised seasonal limits, continued throughout the greater part of March. The lowest March temperatures occurred at various times in different parts of the country. In the western districts they were observed very commonly between the 4th and 6th, when the sheltered thermometer sank to 19° at Arlington (North Devon) and to 17° at Welshpool and Llangammarch Wells. Over southern England the coldest weather occurred about the 9th, when the thermometer fell to 21° at Berkhamsted and to 18° at Wisley, Wokingham, and Marlborough. In the north the 23rd or 24th provided the lowest temperatures, a reading of 18° being recorded at West Witton, 17° at Bellingham, 13° at Scaleby, and 8° at Newton Rigg, in Cumberland. Shortly after the middle of the month there was a brief spell of mild weather, the thermometer rising on the 19th to 61° at Norwich, and on the 20th to a similar level at Fowey. Throughout nearly the whole of March the weather was exceedingly wet,

**Rainfall, Temperature, and Bright Sunshine experienced over
England and Wales during the whole of 1916, with Average
and Extreme Values for Previous Years.**

Districts	RAINFALL							
	TOTAL FALL				NO OF DAYS WITH RAIN			
	For 50 years, 1866-1915				For 35 years, 1881-1915			
	In 1916	Aver- age	Extremes		In 1916	Aver- age	Extremes	
			Driest	Wettest			Smallest	Largest
North-eastern .	In 28 0	In 25 6	In 18 9 (1884)	In 37 2 (1872)	199	186	162 (1884)	208 (1894)
Eastern . . .	28 4	25 0	19 1 (1874 and 1887)	33 1 (1872)	197	181	156 (1898)	205 (1894)
Midland .	29 5	27 6	19 2 (1887)	39 8 (1872)	191	179	148 (1887)	210 (1882)
South-eastern .	33 8	29 1	21 5 (1887)	41 7 (1872)	190	173	137 (1899)	197 (1882 and 1903)
North-western, with North Wales	36 9	37 7	24 9 (1887)	59 2 (1872)	209	200	103 (1887)	226 (1903)
South-western, with South Wales	43 7	41 8	28 8 (1887)	68 6 (1872)	206	200	159 (1887)	235 (1882)
Channel Islands	37 5	33 9	26 2 (1887)	41 8 (1910)	211	209	169 (1899)	251 (1886)

Districts	MEAN TEMPERATURE				HOURS OF BRIGHT SUNSHINE			
	For 50 years, 1866-1915				For 35 years, 1881-1915			
	In 1916	Aver- age	Extremes		In 1916	Aver- age	Extremes	
			Coldest	Warmest			Cloudiest	Sunniest
North-eastern .	47 6	47 5	44 8 (1879)	49 0 (1898)	1237	1343	1008 (1885)	1801 (1906)
Eastern . . .	48 7	48 6	45 6 (1879)	51 0 (1868)	1314	1582	1287 (1888)	1864 (1899)
Midland .	48 0	48 2	45 6 (1879)	51 1 (1868)	1210	1400	1156 (1912)	1715 (1899)
South-eastern	49 6	49 8	48 7 (1879)	51 4 (1898)	1451	1618	1245 (1888)	1983 (1899)
North-western, with North Wales	48 3	48 5	45 7 (1879)	50 3 (1868)	1262	1406	1198 (1888)	1688 (1901)
South-western, with South Wales	49 4	49 9	48 1 (1888)	52 8 (1868)	1465	1631	1294 (1912)	1964 (1893)
Channel Islands	51 9	52 2	50 7 (1885)	54 3 (1899)	1752	1877	1636 (1913)	2300 (1899)

NOTE.—The above Table is compiled from information given in the Weekly Weather Report of the Meteorological Office
 1 For the Channel Islands the "Averages" and "Extremes" of Rainfall and Mean Temperature are for the thirty five years, 1881-1915

The Rainfall of 1916 and of the previous Ten Years, with the Average Annual Fall for a long period, as observed at thirty-eight stations situated in various parts of the United Kingdom.

Stations	1916		Rainfall of Previous Years										Average rain- fall
	Total rain- fall	Dif- ference from ave- rage	1915	1914	1913	1912	1911	1910	1909	1908	1907	1906	
			In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	
ENGLAND AND WALES:													
Durham	27.2	+ 1	28.0	25.9	23.4	29.2	23.0	24.9	24.8	19.4	24.3	23.8	26.3
York	23.9	- 5	24.6	26.3	20.5	33.0	25.1	24.6	24.8	21.3	25.6	22.3	25.1
Norwich	32.7	+21	30.0	27.6	24.4	35.0	26.7	31.8	27.8	25.2	26.3	28.5	27.1
Yarmouth	27.7	+ 9	32.8	27.2	22.6	33.6	20.4	28.5	24.2	22.6	21.9	28.0	25.3
Cambridge	23.8	+ 6	24.1	28.3	18.7	27.3	19.0	22.3	23.1	17.6	21.2	22.4	22.5
Rothamsted	31.7	+14	32.4	27.4	22.0	33.6	27.6	29.7	26.8	23.4	25.3	26.8	27.7
Nottingham	26.5	+ 8	26.9	23.6	22.3	30.1	19.4	24.7	25.2	21.3	23.5	21.8	24.6
Otheadle	34.2	+ 5	34.5	37.7	31.2	38.9	23.8	36.5	37.7	33.3	31.9	34.3	32.6
Hereford	29.7	+13	32.2	27.2	29.8	32.9	25.4	36.4	24.0	23.9	26.7	23.6	26.4
Cheltenham	28.6	+ 6	32.6	27.5	26.7	34.7	21.7	31.1	25.2	20.2	29.0	24.5	27.0
Oxford	31.4	+25	31.5	29.5	25.2	32.5	20.9	28.9	27.5	23.9	26.9	24.0	25.2
London (Kew)	29.9	+25	32.9	27.1	21.9	28.0	23.1	25.5	23.7	22.2	23.8	23.6	24.0
Hastings	35.5	+23	32.1	30.0	30.7	32.0	29.6	28.9	31.4	22.0	23.3	28.7	26.8
Southampton	35.5	+14	41.8	37.0	32.0	37.3	30.4	33.6	36.1	27.8	30.8	33.1	31.1
Stonyhurst	49.2	+ 4	42.4	50.1	42.1	54.1	44.2	53.3	48.8	48.3	50.0	48.7	47.2
Manchester (City)	33.3	- 4	33.8	35.3	20.8	40.6	31.1	37.5	37.0	32.5	33.9	37.0	34.7
Liverpool	24.9	-14	26.8	26.0	25.0	30.2	25.3	26.8	28.4	28.9	26.6	28.1	26.8
Llandudno	26.9	- 3	33.2	31.3	31.8	33.0	30.5	36.7	32.0	30.8	26.3	31.6	30.9
Pembroke	37.4	+ 5	40.2	36.1	41.6	41.0	38.6	38.9	33.1	35.5	37.2	42.5	35.5
Clifton	42.9	+21	37.7	39.7	31.0	44.7	29.9	42.4	39.8	26.6	34.3	30.1	34.5
Cullompton	44.6	+27	40.0	41.9	37.4	47.8	35.0	46.8	34.4	27.5	33.4	35.9	35.1
Plymouth	39.2	+ 9	43.7	45.9	36.5	47.0	37.8	44.3	35.2	31.0	35.3	35.4	35.9
Scilly (St. Mary's)	36.8	+17	53.3	34.3	34.8	36.5	34.2	36.6	27.0	24.7	29.3	29.8	33.1
Jersey (St. Aubin's)	34.9	+ 3	35.9	38.1	26.5	43.3	31.7	44.4	51.7	25.2	28.6	29.2	33.9
^a Mean for the whole of England and Wales	34.0	+14	33.4	33.4	29.0	36.8	28.8	34.5	31.3	26.6	29.9	29.9	29.7
SCOTLAND:													
Stornoway	49.0	+ 8	46.0	50.0	47.0	54.7	48.3	53.0	46.2	52.6	43.8	42.2	48.6
Wick	28.0	- 5	26.4	28.7	24.8	32.5	27.4	32.5	33.6	32.0	29.6	33.2	29.6
Aberdeen	35.6	+16	32.4	28.7	23.8	29.3	27.5	27.7	30.4	28.0	28.7	31.5	30.7
Balmoral	42.3	+21	43.0	38.8	31.2	38.3	29.9	37.5	30.8	26.2	31.8	39.1	35.0
Leith	37.5	+55	25.9	21.1	17.9	25.3	19.9	25.8	27.1	22.1	30.7	30.2	24.2
Marchmont	45.0	+31	33.6	28.1	26.1	31.9	31.7	28.9	34.2	30.7	33.3	35.9	34.3
Fort Augustus	59.8	+35	32.9	42.4	45.5	50.3	44.8	42.2	37.4	43.9	42.0	51.6	44.4
Glasgow	44.2	+14	30.8	36.1	36.2	41.0	36.3	39.2	39.3	35.8	42.6	40.1	38.8
^a Mean for the whole of Scotland	48.7	+11	38.5	38.5	40.4	45.4	41.7	43.2	41.3	43.1	44.5	46.3	43.3
IRELAND:													
Belfast	37.4	+10	36.2	35.0	37.7	44.7	36.3	40.6	35.7	36.7	38.1	36.2	44.1
Markree Castle	55.2	+30	46.6	47.3	45.7	49.1	42.3	53.5	40.7	47.3	45.2	44.6	42.6
Armagh	37.0	+17	29.2	32.1	35.1	35.3	27.6	32.5	28.9	33.1	31.6	30.1	31.3
Dublin	38.6	+38	33.6	26.5	28.8	27.7	25.5	35.4	28.9	25.7	27.0	23.8	27.9
Birr Castle (Parsons- town)	40.6	+23	33.4	32.6	35.4	34.5	31.0	34.2	28.6	33.4	33.9	32.6	33.0
Kilkenny	35.3	+ 7	32.8	32.4	35.1	36.4	36.3	37.4	30.1	33.5	32.4	26.7	33.0
^a Mean for the whole of Ireland.	42.9	+ 9	38.8	38.8	41.9	41.0	36.5	41.0	35.3	39.2	39.7	36.7	39.3

^a The Average Fall is in nearly all cases deduced from observations extending over the forty years 1876-1915.

^a The Mean Rainfall for each country is based upon observations made at a large number of stations in addition to those given above.

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and, owing to the soddened condition of the ground, many places in England reported a complete suspension of farm work. At a number of meteorological stations in the eastern, midland, and south-eastern counties the total March rainfall amounted to more than three times as much as the average, and at Greenwich it was heavier than in any previous March of the past 100 years. The worst weather of the whole month occurred very near its close, when a small but very deep cyclonic disturbance passed eastwards across southern England. In the front of this system the wind on the 27th blew a strong gale from various points between South-East and South-West, and heavy rains fell in Devon and Cornwall—as much as 1·8 in. at Falmouth, and 1·9 in. at Penzance and Newchurch. Next day the wind, in the rear of the disturbance, chopped round suddenly to the Northward and blew a very severe gale over the whole of the eastern, midland, and southern counties, a velocity of 70 miles per hour being recorded at Kew, 75 miles at Yarmouth, and 85 miles at Dover. The gale was accompanied by heavy wet snow which settled upon all objects exposed to its fury and offered great resistance to the onslaught of the wind. The result was seen in widespread damage to telegraph poles and wires, to structures of various kinds and more especially to trees, which were blown down or uprooted wholesale.

Quite at the close of the month the weather underwent a radical change and in April it became more normal than for some time past. Very little rain fell in the first fortnight, and on the 3rd there was a short burst of springlike warmth, the shade temperature rising above 65° in several parts of the country. After the middle of the month the conditions became unsettled and thundery, and on the 17th and 18th heavy rain fell in Wales and the Peak district, as much as 2½ in. at Buxton and more than 5 in. around Snowdon. In the concluding week of April the thermometer in the shade rose to 75° and upwards at a number of places in the midland and southern counties, and touched 78° at New Malden and Isleworth. May opened with a fortnight of cool changeable weather, and on the 1st or 2nd thunderstorms occurred in several parts of southern England. Some rather sharp ground frosts were experienced on the 4th, and again on the 9th, in various portions of the Midlands, but at the end of the third week the thermometer reached quite a summer level, the shade readings of the 21st being as high as 85° at Camden Square (an unusual temperature for May) and 83° at Raunds (Northampton), Norwich, and New Malden. Three or four days later a heavy fall of rain took place over Wales and the west of England, and on the 31st a similar visitation was experienced in and around the lake district.

Owing in a large measure to the cold weather of March the mean temperature of the spring was below the average, more especially in the western districts. Rainfall was largely in excess of the normal; in the south-east of England the total amount was nearly half as much again, and in the midland and north-eastern counties more than half as much again as the average. The duration of bright sunshine was rather variable. In the south-eastern district there was more than usual, and in the north-eastern district considerably less; in other parts of the country the amount agreed pretty closely with the normal.

THE SUMMER OF 1916.

The summer of 1916 included one spell of fine warm weather, lasting in all districts for more than three weeks, and in some for nearly four weeks, from the middle of July to about the middle of the second week in August. With that exception the conditions were mostly cloudy and thoroughly unseasonable, more especially in the earlier half of the summer, when the progress of vegetation was greatly impeded by cold winds and an unusual absence of bright sunshine. In some localities the effect of the polar air was sufficient to cause a withering of trees, and in nearly all districts a considerable amount of damage resulted from the night frosts which occurred locally even as late as the beginning of July.

In the earlier half of June the Northerly and North-Westerly winds and the dull weather resulted in very low day temperatures, often below 50° and sometimes very little above 45° . Thunderstorms were rather frequent, but were accompanied as a rule by very moderate falls of rain, an almost absolute drought being experienced throughout the second and third weeks of the month. On the 4th, however, a rather heavy downpour occurred in the north of England, many places in Lancashire recording about an inch and a quarter of rain, and Macclesfield nearly an inch and a half. In the closing week a temporary improvement in the weather took place, the thermometer rising slightly above 70° in many places and reaching 75° at Little Massingham in Norfolk.

The earlier half of July was distinguished by another period of cool cheerless weather, and in the first week there were several localities in the north in which the thermometer in the daytime failed to reach 55° . A heavy fall of rain occurred in some south-western districts on the 6th and in the extreme north of England on the 7th. On the latter date a still heavier downpour was experienced in eastern and central Scotland, the amount in one day varying in many places between 3 and $3\frac{1}{2}$ in., and reaching as much as 3.6 in. at Dundee. In the closing week of July fine settled weather at

length set in, and temperature rose for the first time in the season to a high summer level. On several successive days the shade maximum readings were over 80° , the highest points recorded being 86° at Woking and 84° or 85° at several places in and around London. Many of the eastern, midland, and southern districts experienced no rain after the 10th, and in the south-west there was none after the 16th and 17th. The drought continued until August 10 or 11, by which time many localities had recorded no measurable quantity of rain for more than twenty-five days. At Plymouth the drought covered a period of twenty-nine days, and at Totland Bay, in the Isle of Wight, a period of thirty days.

Towards the middle of August the weather broke up completely and at the end of the month it again became very cool, the midday temperatures of the 29th being below 60° in many parts of the country. Thunderstorms and heavy falls of rain occurred very commonly between the 14th and 17th. On the last mentioned date a large number of places in the south and east of England experienced at least 2 in. of rain and some places more than 3 in. At Cheshunt the fall on the 17th amounted to as much as $3\frac{1}{2}$ in., and at Torquay and Portland Bill to very nearly 4 in. Further heavy falls occurred locally on the 25th and 26th, the amount at Alnwick Castle and Ardingly on the latter occasion being rather over an inch and a quarter.

For the season as a whole the mean temperature was everywhere below the average, the deficiency of warmth being especially noticeable in the east and south-east of England. The total rainfall agreed very closely with the normal in the north-eastern and eastern, and also in the south-western districts, but was rather scanty elsewhere; at Liverpool less than two-thirds of the average quantity was recorded, and the summer was the driest since that of 1907. The duration of bright sunshine was greatly below the average, the mean daily amount in the midland and southern counties showing a loss of more than an hour per day, and the mean amount in the eastern counties a loss of nearly two hours. In the latter region the summer was the dullest experienced for more than twenty years past.

THE AUTUMN OF 1916.

The autumn opened with a fair September. On the 3rd of the month a heavy fall of rain was experienced in Wales and the north of England, but after that the weather became warm and dry, scarcely any rain occurring between the 5th and 16th. At the close of the first week the thermometer rose to a high level, the shade readings between the 6th and 8th being above

70° in many districts and as high as 75° at West Witton and Bettws-y-Coed. Towards the close of the month the weather became unsettled and thundery, and between the 26th and 29th heavy rain fell at a number of places situated in the western and northern parts of the country.

The first half of October was mild but very changeable, heavy rain being experienced in the western districts between the 2nd and 4th, in Lancashire on the 13th, and over the south-eastern quarter of England on the 17th. On the 5th or 6th the thermometer rose to 70° or slightly above it in many parts of the country, and during the first fortnight the night temperature was above the average for the mid-summer season. In the latter half of the month the weather became much cooler and on the 21st or 22nd sharp frost occurred in several places, the sheltered thermometer reaching a minimum of 22° at Chopwellwood (Durham), and Garforth.

November was mostly mild, the highest temperatures being recorded between the 10th and 13th, when the thermometer rose above 60° in many districts and touched 66° at Worksop. Heavy falls of rain occurred over southern England on the 6th and 7th, the amount exceeding an inch in several localities and reaching on the latter date about an inch and three quarters at Dorchester. Between the 8th and 18th there was a spell of fairly dry weather, and in some places an entire absence of rain. A heavy downpour was, however, experienced in South Devon on the 17th, in many parts of England on the 18th, and in Sussex on the 19th and 20th. The thermometer had in the meantime fallen to a low level, and a stiff Easterly gale which sprang up on the 17th or 18th was accompanied not only by the heavy rain just noted, but by slight falls of snow or sleet. Towards the close of the month the conditions became even more wintry, and early on the 28th a sharp frost was experienced, the sheltered thermometer falling below 25° in several localities and reaching a minimum of 20° at Wokingham.

For the autumn as a whole the mean temperature was slightly above the average, but over the southern half of England the excess was slight. Rainfall showed a slight deficit in the eastern and north-eastern districts, but a large excess at nearly all places situated in the west and south. In the south-east of England the autumn was the wettest since that of 1909. The total duration of bright sunshine was considerably below the average, the amount in the south-western district being smaller than in any autumn of the previous twenty years.

FREDK. J. BRODIE.

NOTES, COMMUNICATIONS, AND REVIEWS.

The Exhibit of the University of Manchester, and the College of Agriculture, Holmes Chapel, at Manchester.—This Exhibit was housed in a special building, and took the place of the usual Agricultural Education Section.

The Department of Agricultural Entomology and Economic Zoology gave an interesting series of exhibits amongst which were, the cabbage root-fly on which special investigations have been carried out during the past three years, and the cabbage gall-weevil and its life history. There was also a comprehensive exhibit of the insects which are chiefly beneficial to the Agriculturist. Perhaps the most interesting of all the items was that dealing with economic status and food of wild birds. Numerous examples of crop-contents from specimens obtained under varying circumstances and in different agricultural districts proved exceedingly popular and instructive, not only to the general body of agricultural visitors, but also to the professional expert on Agricultural Zoology. No less interesting was the collection of devices for encouraging insectivorous birds, and other natural enemies of the larch sawfly; this has been a special study in the University, in view of the fact that extensive larch plantations exist on the Thirlmere Estate from which the Manchester Corporation draws its water supply. The part played in the maintenance of warfare against this particular injurious insect was admirably illustrated, and the rôle played by the pheasant as one of its most successful foes was a matter of interest to those engaged in forestry.

The Department of Economic Botany had a well mounted collection illustrating plant diseases, especially those caused by fungi in farm crops and in fruit; these were very clearly set out and arranged in a way that made their educational effect valuable.

The Livestock division showed excellent large photographs of stud animals placed in different districts of Lancashire and Cheshire, under the Provincial Livestock Scheme; also a map of the province indicating the location of the various bodies which had been formed for the improvement of cattle, pigs and horses. It was noticeable that Lancashire has, of the two counties, taken much fuller advantage of the scheme than Cheshire; this would seem regrettable in view of the fact that there is room for considerable advance in that direction in the latter county.

The College of Agriculture showed a series of charts illustrative of the local advisory work carried out for agriculturists,

variety trials on cereals and roots, and also the distribution of potatoes for seed throughout the North Western Counties. There was also a large and representative collection of turf taken from dairy pastures, showing the effect of manurial treatment, seeding and general management; the marked improvement obtained from suitable phosphatic dressings and lime, and the consequent establishment of clover, was fully demonstrated. Another section dealt with the preservation of fruits and vegetables, both by drying and bottling, in a manner easily put into effect by ordinary householders. A numerous collection of the different appropriate vegetables, and the results obtained from treatment were exhibited. There were a number of cheeses of types used for various purposes and to suit different consumers, also examples of those made from different qualities of milk. Amongst the varieties made were Cheshire, Cheddar, Wensleydale, Caerphilly, Stilton, North Wilts, Derby, Double Gloster, Couloummier, and "Smallholder." The wart disease of potatoes was well illustrated by pot experiments, so arranged as to show the growth and progress of the disease on the plant, the ease with which disease can take place through infected soil, and the way in which immune varieties can resist the same infection. The effect on potatoes of potash obtained from home sources was also shown in another series of pot experiments.

Other exhibits included pathological specimens relating to farm animals and poultry; insecticidal and fungicidal washes for plants and animals; the effect of leguminous crops on cereals, and a portion of the work of the Soil Survey of Cheshire which has unfortunately been interrupted by the War.

The most noticeable feature of the whole Educational Exhibit was the large number of persons seeking advice on matters relating to every branch of agricultural pursuit. During the whole of the Show week this building was filled with those desiring information, and the strong demand kept the members of the Staffs of both the University and the College of Agriculture very fully occupied.

T. J. YOUNG.

Agricultural Machinery. *Notes de Culture Mecanique*, par Dr. Chauveau, Sénateur. (Paris, J. B. Baillièrre et Fils. 1917.)—Dr. Chauveau's interesting and valuable book on agricultural machinery is all the more interesting and valuable in that it has for starting point the present situation, and not only deals with the origin and past development of the movement in favour of the application of mechanical power to farming, but also offers sound schemes for the reorganisation of agriculture after the war. The problems with which France—and indeed almost all European countries—will be faced on the cessation of hostilities

may be summed up, from the point of view of the agriculturist, in the need of the increased production of cereals, together with a lamentable shortage of men and animals. Dr. Chauveau is firmly of the opinion that the main factor in the solution of these problems is the wide-spread adoption of agricultural machinery. He advocates thorough and far-reaching measures in which the State shall play its part by encouraging and partly financing this newer style of farming, and he supports his case with arguments most convincingly put.

How, indeed, can the lack of men and horses be effectively replaced if not by mechanical power? By using motor tractors to plough and harrow his fields the farmer need employ far fewer men than in the ordinary way, and no horses at all. Moreover, out of the number of men remaining after the war, it is obvious that comparatively few will be inclined to return to farming under the conditions in which they knew it in pre-war days. They will need higher wages, better conditions, and a generally improved standard of life. These would be the natural results of the industrialisation of farming, for once the skilled mechanic takes the place of the unspecialised labourer, the scale of wages is bound to rise. To balance this, from the farmer's point of view, there would follow an improvement in farm operations as performed by machinery. A comparison of the two methods indicates that, other things being equal, an improvement of 25 per cent. in the work may be expected when the fields have been tilled by mechanical power. Following again upon this improvement comes the increase in production, leaving a wider margin of profit for the producer than it was possible for him to realise before. In fact, when the two methods of cultivation are placed side by side, the use of mechanical power shows at every point its superiority over that of animal power, except in the one matter of adaptability. And for this reason chief among others it is not proposed to do away entirely with the use of horses on the farm; but the place assigned to the horse should be rather that of a supplementary or emergency worker, leaving the main bulk of the work to be performed by mechanical power. The latter offers advantages that no other power can give; it renders the farmer to a large extent independent of weather conditions, by allowing him to speed up his ploughing or harvesting, when necessary, so as to carry through the work on the whole of the farm while favourable weather lasts. Again, once the machinery is bought and set up, the cost of its upkeep is considerably less than that of its equivalent in animal and human power. Apart from the relative costs of the food necessary for each, there is the important consideration that the animal must be fed constantly, whether at work or not, while the motor only consumes petrol

during the actual time it is in use. In illustration of these points appear some interesting figures showing the comparative costs for 100,000 kilogrammètres, according to the nature and extent of the power employed.

The chief, and the only real difficulty that has to be overcome in the carrying out of this system of farming, is that of the outlay of capital involved. It is here that the help of the State is to be looked for, both as regards direct financial assistance and moral security on behalf of the farmer as *entrepreneur*. The author argues justly that the small capitalist has a claim upon the State in this direction, since in no other way can he make the best and fullest use of the soil for purposes of production.

The question then arises whether, in view of the desirability of this system, the science of agricultural mechanics has as yet reached the stage at which its application can be considered justifiable. Are there, in fact, machines now on the market fitted to replace the animal and human power that have hitherto been in use on the farm? The answer, to be satisfactory, must involve a detailed account of the forms of mechanical power at the disposal of the farmer, as well as a comprehensive list of the patterns of each, from which he may choose what is best suited to the needs of his particular management. This Dr. Chauveau has given with admirable thoroughness and lucidity. Of the various sources of power which man may command through machinery, that of wind is here left out of account as being too uncertain to be of any use; hydraulic power is noted as being seldom used except in connection with electricity, though an interesting example of the direct application of this force to agriculture is to be found at Vomano in Italy, where the water from a fall close to the farm is brought by a wooden canal to a water-tower 13 mètres high, and so sets in motion a water-wheel which in its turn works a tractor some 700 mètres away, at the edge of the fields. However, there are three forms of mechanical power universally recognised as applicable to farming, namely, steam, motor, and electricity. A brief sketch of the history of each brings out the fact that in the development of steam power the English have always taken the lead, starting with James Watt's unsuccessful attempt to apply his discovery to the process of ploughing in 1780, and followed up in 1833 by Alexander Gordon, under the auspices of whose Society of Encouragement the first steam plough was set working. On the other hand, the French have set themselves to develop the possibilities of the motor, and ever since the year 1894, when the greater simplicity of the motor as compared with the steam engine was strikingly displayed at a *concours agricole* of the Automobile Club de France, the perfection of the motor plough has been a problem of absorbing interest to the French mechanic. With the electric

machine also the French seem to have held their own with the Americans, while this form of power has apparently created the most universal interest of any, Germans, Italians, Austrians and Belgians, all contributing their quota to the store of discovery and invention. The Automobile Club de France has been especially enterprising in its organisation of shows and competitions for the promotion of these inventions, and it is probably due to their energy and perseverance that in 1913 the French Ministry of Agriculture gave to the movement official recognition by organising a national exhibition of mechanical tillage. This event may be looked upon as a landmark in the history of French agriculture. The demonstrations took place at Grignon, and included certain tests, some obligatory and some optional. The Jury was appointed by the Ministry, with the object of drawing up a report of the demonstrations as well as of judging among the competitors. Only about twenty of the latter entered their machines, and Dr. Chauveau considers that in view of this fact the Jury was somewhat rash in drawing general conclusions as to the relative merits of the types of machine. However, not the least important result of the exhibition was to prove clearly that a number of machines, suitable for almost every kind of farm operation, were steadily approaching towards perfection.

There follows an illustrated catalogue of 180 patterns of machine already on the market, including (1) the heavy motor or steam tractors that simply take the place of horses in drawing the plough, and which form the largest class—a certain American pattern known as the “Caterpillar” being alluded to as the parent of the famous “Tank”; (2) motor ploughs, in which the ploughshares are fixed to the chassis by a rigid bar and worked by means of levers—the type of machine most popular in all countries, being light and easily worked by one man; (3) machines designed to till the field in a single operation—a comparatively small class.

Thus it appears that the choice the farmer will have to make in the near future lies not so much between the horse and the machine as in selecting the type and pattern of machine best suited to his purpose. In considering the relative merits of the steam engine, the motor, and the electrical machine, almost everything depends on the nature of the work it is intended to perform, and the nature of the soil on which it is to perform it. The steam plough is admirably suited for heavy work, and the powerful American machines, such as the Fowler steam plough, are unrivalled in breaking up large tracts of uncultivated land. On a small or medium sized farm, however, they are of little use, except in the cultivation of beet fields. Moreover the cost of a steam plough is considerably increased by the coal necessary

to run it, and by the labour involved in transporting water, often from long distances; it is therefore only a very large enterprise that can afford both the heavy initial cost and the subsequent labour entailed. In normal times, the average cost of steam-ploughing was reckoned at 20 to 50 francs per hectare, according to the depth of ploughing, and to this one quarter of the cost must be added for fuel and the transport of water.

The motor plough or motor tractor is on the whole better suited to the needs of the average farm, especially in Europe where areas of cultivation are so much smaller than those of the Far West. It has the disadvantage of being less adaptable to obstructions in the ground than the steam engine, but this fact is certainly outweighed by the numerous advantages such as economy in fuel, quickness of starting, reduction of labour, and so on.

With regard to the use of the electric machine, it is perhaps the ideal method of performing farm operations. The one source of power, the electric plant, can be used in any number of departments, and conveyed all over the farm by means of wires, instead of by the clumsier methods of pulleys or transports. The extension of electricity to the fields is a comparatively recent development, though as early as 1878 a somewhat primitive electric plough was set to work at a sugar factory at Sermaize. Again, the electric apparatus, once installed, requires the minimum of labour; its cost is not excessive, and there is no wastage of power since the work and expenditure are exactly balanced. A comparison of the costs of the three methods give the following averages: (the figures relate to pre-war experiments)—

Steam, 0 fr. 20 cm. per horse-hour.

Motor, 0 fr. 15 cm. „ „

Electric, 0 fr. .095 cm. per „ „

The conclusion therefore appears to be that electricity is the most practical and economical form of mechanical power to employ on the farm. Unfortunately, however, the difficulty of obtaining electricity in country districts is so great that except in the rare instances when the farmer can set up his own plant, this system must at present be considered ideal rather than practical. This leaves the motor as likely to be the most profitable investment, and indeed the results of practical experiment as well as of theoretic reasoning point to this conclusion. The adoption of motor ploughs and tractors should ensure a high return for the farmer, an increase in production for the nation, and should also be the means of bringing back to the farm both soldiers disabled in the war and men whose strength and energy are at their height.

In France, the Government have already taken steps to promote the use of agricultural machinery, and only recently M. Clémentel, the French Minister of Agriculture, obtained from the State a loan of 30 millions for the purpose of organising mechanical tillage in bringing abandoned areas back into cultivation. Dr. Chauveau urges that this is but the beginning of what waits to be done in this direction; rejecting the system of co-operation as being suited only to quite small farms lying close together, and dismissing as impracticable the German system by which the State purchases the machinery and is repaid by the farmer in six annuities, with interest at 4 per cent., he submits a scheme by which the State should contribute one-third of the cost; one-third should be paid down by the farmer, and the remaining third, left owing to the maker, should be gradually paid off by the farmer, whose security for this loan should be the State, under a system of Agricultural Credit. The scheme is a bold one, but it is probable that during the period of general reconstruction after the war bold schemes will prove the most effective. In addition to his own observations and theories, the author has included in a final chapter the opinions of a number of prominent agriculturists,—French, English, American, and Italian. The verdict of the majority is in favour of the movement; many make reservations as to the state of efficiency obtainable in agricultural machines as already existing; almost all of them see in the adoption of this system the only means by which the economic development of agriculture can be assured.

M. A. BURGE.

Agriculture after the War.—A. D. Hall, F.R.S. (pp. 137. John Murray, 3s. 6d. net, 1916). The attitude of many agriculturists towards State interference with their methods of business is not always quite logical. They object, on principle, to the fixing of maximum prices or minimum wages, but they would eagerly accept a minimum guaranteed price for wheat. If the State inaugurates some experiment or object lesson a few are keenly interested, some are mildly amused, and many are entirely unconcerned. This expression of one side of human nature is not confined to farmers, but the time is coming, is indeed being pressed forward by prevailing conditions, when they will require to adopt some logical attitude towards State action which can, with fairness, be applied to the majority of cases which will arise. There is no keener champion of British agriculture as a whole, and it has no more candid friend, than Mr. Hall, and few people have a wider experience of the industry. The publication of his *Pilgrimage of British Farming* in 1913, did much to stimulate interest and restore confidence in the industry amongst the reading public. Mr. Hall now suggests

that it may be necessary for the State to provide guaranteed prices for cereals or premiums on land turned to arable cultivation; to establish machinery for fixing minimum wages; institute demonstrations of forms of organisation of production; even, possibly, to become the owner of all agricultural land. If, after the conclusion of hostilities, public policy turns towards national organisation for defence rather than for opulence, some or all of these actions may be necessary, and agriculturists will need to give them careful consideration. It is scarcely possible that there could be a better starting-point than this little volume, which deals with nearly every question of broad bearings which is likely to arise. Besides the subjects mentioned, Mr. Hall deals with our dependence on imported food; the decline of British agriculture; the comparative productivity of arable and grass land, and the dependence of arable farming upon prices; possible developments in the organisation of production; agricultural education; land reclamation; and the development of special phases of agriculture and subsidiary industries.

As so much stress is laid on the requirement of some form of financial stimulus for arable farming one essential is lacking, *i.e.*, a survey of the recent trend of the supplies and prices of agricultural products, with some attempt to foreshadow future movements. The general public refuses to believe that farming has been anything but a prosperous business during the last ten years, and its demand for proof to the contrary might be strengthened by figures given by Mr. Hall. Without some information on costs and methods of production in countries competing with British farmers for our markets, and on costs in our own country, the public will not easily be convinced of the necessity for financial guarantees. It is an advance from controversial days when we admit, as Mr. Hall does, that "the maintenance of agricultural prices is likely to be attended by some expense to the nation"; and when this is accompanied by the admission that "it is more than possible that the need for bounties will not arise; before the war it seemed likely that the rise in fundamental food prices would be maintained for some time to come, and they were high enough to sustain much of the development of agriculture we are seeking," the need for producing definite evidence of the necessity for financial guarantees cannot be escaped. The leaders of the industry have undoubtedly lacked confidence in its future, but the grounds of that lack of confidence have not been expressed in a form which convinces the industrial public—which would have to provide the money for guaranteed prices—that it is well founded.

Agriculture is an industry in which few potent ideas on the organisation of production arise, but perhaps few people will

recognise that in the suggestion for the establishment of "industrialised farms," Mr. Hall is following the best traditions on this line that have grown up in the industry. To enlarge farms to provide greater scope for capital and managerial ability formed a large part of the propaganda of Arthur Young and the notable band of worthies connected with the old "Board of Agriculture." The development of the idea in the hands of Mr. Hall deserves the immediate attention of the leaders of the industry, both landowners and farmers. The demand for small holdings arose very largely outside the industry, but it has been left for an agriculturist to insist on the adoption of the colony system on their establishment. The chapter in which these subjects, together with education and land reclamation, is dealt with is the most interesting in the book. No matter what is the ultimate decision on public policy as to guaranteed prices, future progress on some of these lines is almost inevitable. If more agriculturists were mainly interested in the financial side of the business, there would soon be some enterprises in the nature of the industrialised farm, and the public demand for small holdings shows no signs of abatement, while the suggestions on the education of landlords have already been taken to heart by some of the leaders of the industry, and associations of agriculturists are asking for increased facilities for technical education for farmers and labourers. Before the war is over the State is almost certain to consider experiments in improvement and reclamation of land for cultivation. Sound development of the industry will depend upon commercial experiment in methods of cultivation and in the general organisation of production and business, with public enterprise in the supply of educational facilities. These may be facilitated or retarded by certain aspects of public economic policy, but without them no real progress will be made; and all public-minded men agree that some development is desirable.

A. W. ASHBY.

Live Stock of the Farm.—By many Specialists under the Editorship of Professor C. Bryner Jones, M.Sc., F.H.A.S. Six vols.—(The Gresham Publishing Co.). This stupendous work is well illustrated, particularly well printed, and beautifully got up generally.

All who know the Editor will be prepared to find that the control of this vast compilation has been thoroughly and sensibly carried out, and the popular Agricultural Commissioner for Wales, as every one knows him to be, tells us in the first page of his preface that "... the Editor has used his discretion." One is bound, therefore, to admit to very great disappointment when reading the two first volumes on Cattle. All conversant with such matters know what the enthusiasm

of the specialist may lead to, but we think that this amiable weakness might have received some check. For instance, we may learn from the author of the "British Holstein" chapter that cows of this breed give quantity of milk, but (page 53) "that it is not so rich as that of other breeds," and again, over-leaf, that "*Calves grow faster and larger on this milk than on milk with a higher percentage of fat.*" Turning to the chapter on Herefords, we are told that cows of this breed give little milk, but that it is of high quality, and on page 81, that "*Hereford cows are splendid mothers, and their milk is so rich that their calves always look well nourished.*" These sorts of assertions, seldom upheld by any data, figures, or proof, are so frequent that it is a pleasure to find that the excellent article on Highland Cattle does not inform us that this breed is celebrated for its early maturity, and that Mr. T. W. Hammond, in his very instructive article, is sufficiently restrained to admit that the Jersey (page 97) is not the best of beef producers when finished with as a dairy cow.

These blemishes are further intensified when we come to matters of general principle. On page 159, Mr. Robert Bruce makes some very sapient remarks about the "weak points" of a theory which holds that "shapes and conformation" of any particular kind are necessary to the capacity of yielding large quantities of milk. Nevertheless, on page 228 *et seq.*, the writer of the chapter dealing with "The Selection and Judgement of Cattle," mentions nine different points dealing with shape and conformation, all of which, without any reasoning whatever, the reader is asked to believe a dairy cow "should" possess. Surely these cross writings must confuse the student, and greatly delay all hope of improvement. But probably the most important and improbable of all statements that we are asked, without any authoritative reference, to believe is that on page 58 of Volume II. Here is a chapter dealing with "The General Management of Cattle"—a chapter that in many ways will well repay the reader's close attention—and in it the following words appear:—"It has been proved beyond doubt that the offspring of a tuberculous cow is perfectly free from the disease at birth." Such an assertion, without the authority of some world-known specialist, is, if true, almost insulting to other writers and if inexact absolutely pernicious.

These remarks have exceeded the space permitted for the first two volumes, so that the reader must be left to find out the value of very many interesting articles for himself, though we may give ourselves the pleasure of calling attention to Chapter I. and the article that follows on Aberdeen Angus Cattle.

Volume III. deals with Horses. It begins with a history and description of breeds, and is interesting and instructive if, in

places, somewhat vague. The war is responsible for making the foods mentioned in Chapter III. sound out of date; indeed, this is so in all the volumes dealing with Cattle and Horses. In this chapter, however, on page 132, we are certainly told something new, for to groom a horse while he is eating his morning feed is certainly against the teaching of any experienced horse-master. It is also somewhat astonishing to learn, on page 172, when reading of hay for bad-winded horses, that "clover and rye-grass are not good, as they contain too many fat producing substances." This quotation is from the veterinary section, which is, however, most interesting, and likely to be of great use to the horse-keeper.

Volume IV. is devoted to Sheep. Sir R. H. Rew writes an introductory chapter, "Sheep-farming in the British Isles," which contains some very interesting statistics and deductions therefrom. We venture to think, however, that many provincial farmers will question the author's deduction on page 10, from the prices quoted. Our experience leads us to venture the opinion that for first quality, from 1896 to 1905, to average 5s. 9d. (less commission and carriage) was so rare as to be not worth recording. We are inclined to believe that during that period purchasers converted whatever the farmer had to sell into a second or even third quality sheep. Judging by prices obtained in some of those years we are surprised that a fourth quality is not recorded. This chapter is followed by articles dealing with twenty-nine breeds. Many of the authors are new to fame as writers on this subject; the public will judge of their competence. The lamented death of Professor Wrightson will give a special, if sorrowful interest to the chapters on "Profitable Sheep-Farming," and on "General Management and Feeding." Professor Cave, F.R.C.V.S., has undertaken the chapter on Diseases. He deals specially with that part of the subject to which he himself has given so much attention, to wit, Parasitic Diseases. The Professor does not in any way disguise the difficulties of fighting these insidious pests, and is most careful to urge upon sheep-masters the necessity of prevention in view of the present state of knowledge about curing. For this, as well as for other reasons, we can recommend this part of the volume to the close attention of all interested in sheep.

Volume V. Only half of this volume is devoted to Swine husbandry. Here we have a somewhat different treatment. Breeds are all dealt with by one author only. When it is said that the section is entrusted to Professor James Long, it follows that the matter is well and attractively set out, but it is equally certain that no one writer dealing with nine different breeds, can have the authority of a specialist capable of giving an opinion about his own particular breed, or even two or three

breeds. Mr. Sanders Spencer follows with a very valuable chapter on "Management and Feeding." Those who know of the experience and wisdom of this expert will be fully alive to what to expect, and will not be disappointed. One imperfection may be mentioned. The author, owing to his wide knowledge, is apt to forget the ignorance of others; for instance, on page 65, when speaking about feeding, he says, "the mistake of giving too great a proportion of separated milk," &c., yet no information is given as to what is the correct proportion in any part of the section "Pigs and Dairying," in which not only the above, but several other warnings are given. An *expert* may pick out of the following section, on "Experiments on Pig Feeding," the knowledge he requires on the point; but the *tyro* not unnaturally requires the direct help of so able an authority as Mr. Spencer, whose article, we feel sure, will be left with regret. "Bacon Curing," by Professor Loudon Douglas—we recommend it to the attention of all interested in swine husbandry—is followed by a chapter on "Disease," by Captain Leeney, M.R.C.V.S. This well-known writer does not attempt to do more (and who can do it so well?) than direct the pig-keeper as to what should be done if professional advice is unobtainable, or till the veterinary surgeon arrives. The same celebrated authority on veterinary home-doctoring is also responsible for the chapter on the "Diseases of Cattle" in Volume II.

Before finishing this review—which circumstances of all sorts have made too brief—we must express regret that the publishers have not been able to add to the value of the work by printing a more detailed general index, or even one for each section. This is of the first importance in a work of reference.

K. J. J. MACKENZIE.

British Sheep and Shepherding.—W. J. Malden.—(London: Macdonald & Martin.) The author of this work is justly reputed as an authority on the breeding and rearing of sheep, and he has herein collected together a mass of information of much practical value and importance. The introductory chapters deal with general principles and are partly historical. These are followed by a short account of the sheep census of 1908, giving the numbers for the several breeds then existing in Great Britain. The succeeding chapters contain descriptions of these varieties with hints for the selection of suitable breeds for particular localities. The "points" of a sheep are next dealt with, and there are short sections on how to handle sheep in order to determine their condition, on dentition, and on the nomenclature applied to sheep in different parts of the country. Then follow a series of chapters on shepherding and the management of the flock, and these in our opinion constitute the

most valuable part of the book. The author has incorporated into it much of the material contained in his previous work on "Sheep-raising and Shepherding," and in so doing has consulted the convenience of the reader and added very appreciably to the value of the present volume. Mr. Malden has been fortunate in securing the co-operation of Professor Barker, of Leeds, and Mr. Harold Leeney (now Captain Leeney, A.V.C.). The former contributes an account of British wool and its possible improvement, with remarks on the marketing of the fleece, while Captain Leeney is responsible for the veterinary section, including a final chapter on the drugs and instruments which it is desirable for a flockmaster who is not in easy reach of professional aid to keep in store. These two sections, written by persons with expert knowledge, form a useful addition to what is on the whole a valuable work.

Where so much is excellent it may seem ungracious to criticise. Nevertheless the reviewer would not be fulfilling his function if he failed to point out that the author has allowed himself to make statements which, put forward as they are without any qualification, detract seriously from the book's usefulness. Thus, on page 91 we read that "the male generally influences the outward form of the offspring and, it is popularly held, the female the constitution." This assertion has been often repeated, yet as far as we know it rests upon no certain foundation, or indeed on any basis whatever beyond that derived from a vague impression. Still less excusable is the dogmatic statement on page 89 that "the male is naturally prepotent over the ewe." These assertions are the more unaccountable in view of the fact that the author appears to be aware of the recent work in heredity by Professor Wood and others. On page 25 the author tells us that "as all breeds have intermixture of blood, the sheep will tend to follow the features of the component breeds which appreciate or are most influenced by any change of food to which they may be submitted." This statement sounds plausible, but one would like to know upon what authority it is made. On page 39 we are told that in the Suffolk sheep the horns have been bred out, whereas a visit to any agricultural show where these sheep are exhibited is sufficient to convince one that this assertion is only partially true. Certain other statements regarding the Suffolk sheep (for example, the assertion that on being bred with the Cheviot it produces an exceptionally valuable cross) appear to us questionable. On page 79 Mr. Malden tells us that "all the crosses met with in the North of England have their foundation in the mountain breeds." Again one would like to know on what evidence the assertion is based. These are examples taken from a number of similar statements to

which the author has committed himself on what appears to us a very slender foundation of fact. The remarks on flushing ewes prior to tupping would have gained force had it been pointed out that the practice has a sound scientific basis, since the number of lambs born depends upon the number of eggs discharged at the oestrous periods, and consequently that no sort of special treatment could increase this number after the eggs have once been fertilised.

The absence of an index is another serious defect. We hope that this omission will be made good in a new edition.

F. H. A. MARSHALL.

Agricultural Geology.—R. H. Rastall, M.A. (Cambridge Geological Series. Cambridge University Press. Price 10s. 6d. net.) Geologists and agriculturists work largely with the same material, to both a thorough practical acquaintance with natural phenomena is an absolute necessity and the application of some of the large store of knowledge accumulated by the former should be of great practical value to the latter. Yet, judging from the literature of the subject, the connection between Geology and Agriculture is elusive, and a large gap has to be filled before Geology becomes a subject of real interest to the agriculturist. For this reason the publication of a modern and thoughtful book on *Agricultural Geology* is to be welcomed.

Mr. Rastall's is the latest work of the kind referred to. It forms an important addition to agricultural literature, and is especially suited to the requirements of advanced students and those sitting for higher agricultural examinations. It is full of suggestion, and a fund of information is to be found among its pages, but it cannot be considered an open book for the general reader. For the thoughtful student, with previous knowledge of Geology, there is no doubt that it thoroughly achieves its object of supplying "a concise account of those parts of Geology which are of direct interest to agriculturists," and will be of considerable value.

Although the author has given much care to the definition of geological terms in the early part of the book a fairly extensive geological knowledge on the part of the reader is necessary to get the full benefit from the work, and it is possible that the book would have been of equal value if those explanations which are to be found in every text-book of elementary geology had been omitted. This would have left space for amplifying other parts of the book which are of very great interest.

The comprehensive survey in the chapter on Soils and their Formation is especially interesting reading, but requires supplementing by further information.

The principles governing water supply and drainage are well set out, and here it is easy to see how important the application of geological knowledge may be to the farmer.

A study of the special chapters on the Rock Formations and Soils of the British Isles reveals the care the author has taken over the subject, and at the same time the difficulty of the task. The scheme is that sanctioned by custom in books on "Agricultural Geology," that is to say the formations are described in chronological succession, and the descriptions are accompanied by agricultural notes and comments. It is unfortunate, from the farmers' point of view, that by this method emphasis is placed on geological nomenclature and geological distinctions for which the agriculturist has little enthusiasm.

The book concludes with a very interesting chapter, contributed by Dr. Marshall, on the origin and history of domesticated animals.

Although it is felt that improvements in arrangement and treatment of the subject would have been desirable, the book unquestionably marks an advance in this type of work, which deals with a difficult subject.

S. T. PARKINSON.

Organic Agricultural Chemistry.—Professor J. S. Chamberlain, Ph.D. (Massachusetts Agricultural College).—Macmillan, New York (pp. xvii. + 319, 7s. net.) Agricultural chemistry may be divided into two distinct branches—one dealing with the relation between soils and crops, the other with plants and animals as living things. It is this latter branch of the subject which Professor Chamberlain sets himself to discuss in the volume under review. Nowadays it is customary to use the name Biochemistry for that branch of chemistry which deals with living things, and Professor Chamberlain might well have called his book Biochemistry for Agricultural Students.

The first half of the book gives a short account of the general principles of organic chemistry written with what may be called an agricultural bias. The next quarter deals with the general chemical principles of enzyme action, digestion, nutrition and excretion in animals. A very short account is then given of plant physiology, and the rest of the book is devoted to the composition of crops and the general principles of animal nutrition.

Throughout the book experimental exercises are given, and at the end of each section there is a list of books to which the reader may refer for further information. The book is a useful addition to the literature available to the serious agricultural student who is interested in the scientific side of his work. In it is collected a great deal of information which the

student would formerly have been compelled to collect for himself from numerous sources. It is not, however, very readable, for it is written in short self-contained paragraphs, many of which dismiss the subject with which they deal with an air of finality which is not justified by the present state of our knowledge. For instance, inulin, the starch-like constituent of artichokes and similar plants, is dismissed with the remark that it is not hydrolysed by diastase or ptyalin and is therefore not digested by animals. This statement is quite at variance with the experience of medical men who have used inulin for diabetic patients.

The practical farmer is not likely to derive much satisfaction from reading this book. It is written for students, almost entirely from the scientific point of view, and the author does not attempt to apply his general principles even to the compiling of rations for stock.

T. B. WOOD.

The Marketing of Farm Products.—L. H. D. Weld, Ph.D.—(Macmillan, 1916, pp. 483, 6s. 6d. net.) There is an interesting theory that discontent amongst the agricultural classes arises chiefly during periods of gradual improvement in their conditions rather than during periods of actual depression; or that discontent arises particularly when the standard of life is rising more rapidly than incomes, or the demands and aspirations which lead to a higher standard of life are developing more rapidly than the material means of satisfying them. Under close examination the grounds on which this theory is based appear to be well founded and the modern discontent of the American farmers and consumers with the discrepancy between the producer's selling price and consumer's purchasing price of farm products seems to support the theory. This discontent arose in the late "nineties" and came to a head in the early years of the present century. So far as any changes were taking place the condition of the farmer was improving, but undoubtedly the farmer and, more particularly, his family were making greater demands on life. Since 1907 the purchasing power of wages of industrial workers has been declining and the dual discontent of farmers and consumers has been the cause of many attempts to analyse the system of marketing farm produce with a view to the elimination of unnecessary processes or profits. The first systematic analysis was made by the Industrial Commission of 1900, part of whose report dealt specifically with this subject. Since then many other studies have been made.

The stage of enquiry has not yet been passed, but recent books on the subject, of which Dr. Weld's volume is somewhat typical, are not confined to analysis: they attempt to lay down

principles, discuss proposals regarding the amendment of the existing system of marketing, and generally offer guidance to interested persons, especially students of agriculture. As stated by Dr. Weld, "the subject of marketing deserves the attention it is now receiving, and the frequent criticism that our state agricultural colleges have devoted relatively too much energy to teaching farmers how to raise more crops, and not enough to teaching how to market them, is largely justified." Marketing is rather more important in a country which is a large exporter of farm produce than in an importing country like our own with a large consuming market within a relatively short distance of every farm, but in our own country complaints have been heard which cannot be answered until a much more scientific analysis of prevailing systems has been made than has yet been attempted. Many of our own producers, especially of perishable products, find that ability to secure a good market is as great an element in success as the ability to grow good crops. And as profit is a great stimulus in production it is probable that an improvement which could be made in marketing would have considerable reflex effect in that sphere. English agricultural colleges and the societies existing for the improvement of agriculture might be well advised to consider the fact that whilst they have given practically no attention to the subject, many American colleges, Chambers of Commerce, and Boards of Agriculture now have special departments dealing with the organisation of marketing.

Many of the aspects of this subject are now of international interest. For instance, the following table from Dr. Weld's book could not fail to interest an English arable farmer with a keen business instinct.

Costs of Marketing Kansas Wheat.

	Cents per bushel
Price received by farmer in Kansas	87 00
Margin taken by Country Elevator	3 00
Price paid by shipper	90 00
Freight rate from point in Kansas to Galveston	15 00
Inspection and weighing at Galveston	25
Gross profit of shipper	1 25
Price paid by exporter	106 50
Cost of elevating and loading into boat.	1 25
Freight, Galveston to Liverpool	6 00
Insurance, &c.	75
Overhead expenses of exporter	1 00
Net profit of exporter	1 25
Price per bushel at Liverpool	116 75
(or approximately 4s. 10d. per bushel).	

Nor could Dr. Weld have fallen into some errors in his chapter on auction markets if any accurate study of English marketing systems were available. He states that "one interesting feature with regard to the commodities sold at auction is that they are invariably raised in districts remote from markets where they are sold in this way, and that attempts to handle near-by products have generally failed. This fact is even more evident in England where the auction method is used largely for imported products, and not for products raised in England." This may be partly true in regard to fruit and vegetables, but even in this sphere several "country" auction markets have been of immense value to the producers, and in spite of our failure to study marketing Dr. Weld ought not to be ignorant of the methods of our live stock markets.

Many English readers will be interested in American markets as they are affected by their organisation, and in the chapters on price quotations and future trading they will find much information with some direct bearing on the supply and price of our food imports. Few people who talk of "wheat corners" ever realise that there is never any corner in actual wheat, but only a corner in forward contracts to supply the grain. Thus the success of any corner ultimately depends on the enforcement of the law of contract. This is not explicitly stated by Dr. Weld but it is implied in the whole system. The trading in wheat in the great markets like Chicago entirely depends upon the fiduciary value of papers such as warehouse receipts and contracts. The economic value of trading in futures is that it shifts certain risks from "actual merchandisers" to "professional risk-takers" and that it maintains a continuous market, even though little or no actual grain may be bought and sold. The description of the process of "ringing out" by speculators, and of the functions of the Clearing Associations, which enable speculators whose volume of contracts is much greater than the volume of actual trade in grain to clear their transactions by paying or receiving balances is very illuminating. But when all is said the upkeep of many professional speculators and their offices is a heavy price for the producer and consumer to pay for the maintenance of a continuous market in which the prices represent opinions of what the price will be at some future time when the existence of the commodity supposed to be sold is itself problematical.

Like some other American books of a similar type this volume requires much application on the part of the reader, as no attempt is made to stimulate interest through the style of the presentation of the matter. But the material is good, and the subject is of great importance to persons concerned with the future of agriculture.

A. W. ASHBY.

The Song of the Plow; Being The English Chronicle.—By Maurice Hewlett.—(Heinemann, pp. xi. + 243.) *The Song of the Plow* is nothing less than the history of the English labourer from the Norman Conquest down to the present time, told in some two thousand lines of verse. As history, it is extraordinarily interesting and vivid; Mr. Hewlett possesses in a high degree the gift—no reader of his novels will deny it—of making historical people as real and alive as are the people we meet every day. And Hodge, the hero of the *Plow*, though he is of necessity a type and not a person, is yet a living type; and no one who has at heart the interests of the working man can fail to be held by this story of the wrongs done to Hodge through the ages.

Unfortunately, that very quality which makes history told by Mr. Hewlett such delightful reading robs it of its historical value. For to see and describe really graphically is generally to do so one-sidedly, and in the *Song of the Plow* the author as poet is so deeply concerned with the injustice done to the working classes that he pays no attention to the economic view of the events he narrates. To take as an example the vexed question of enclosures; the advocate of that system is dismissed with scorn as “your rural economist,” and the whole movement is categorised as “Gormandise.” Mr. Hewlett has ranged himself with the tribe so indignantly classified by Arthur Young as “the Goths and Vandals of open-field farmers;” and in the tale of the eighteenth century we read a great deal about Hodge’s loss of social freedom, but not a word of his advance towards social freedom—we find no hint, for instance, of the fact that Hodge might now for the first time eat fresh meat and wheaten bread like a lord.

It is a little disappointing, too, to find Cromwell so summarily treated:—

“Betwixt King Cromwell and King Charles,
Betwixt old priests and new-fledged pastors,
There’s little difference to poor cattle,
Ploughing the harrow and the hoe
On fields as guiltless of their snails.”

In fact, the only two occasions on which disinterested fellow-feeling is allowed to be displayed towards Hodge are the coming of the Franciscan friars—told in some very charming lines—and the mission of John Wesley, who is hailed as a “Strong Deliverer.” All sovereigns, politicians, economists—all of the governing classes are treated as tyrants, and if not morally corrupt then at least as greedy and seeking only their own ends.

However, the Envoy to the poem suggests that all these burning wrongs will be righted if only Englishmen will

recognise their equal brotherhood with each other, and that if this recognition were the outcome of the War, in which Englishmen have fought side by side, their supreme sacrifices will not have been made in vain. The poem ends with a spirited appeal that our disabled soldiers may be given as their own a piece of that land for which they have been fighting; and so "Hodge shall win at last his land." M. A. BURGE.

Co-operation and Research Work.—Recent enterprises in connection with the preparation of food and the development of its concessions in West Africa and elsewhere, have led to the establishment of a Research Department by the Co-operative Wholesale Society, and Dr. Geoffrey Martin, M.Sc. (Bristol), B.Sc. (London), has just been appointed to direct its work. Dr. Martin is a well-known chemist, and the author of several standard works on the application of science to industry.

This appointment marks a new departure in connection with the co-operative movement, and has been rendered necessary by the concessions acquired by the Co-operative Wholesale Society in West Africa, Nigeria and elsewhere, as well as by the development of fresh undertakings at home.

M. LE MARQUIS DE VOGÜÉ.

THE death is announced of M. le Marquis de Vogüé, President of the *Société des Agriculteurs de France* from 1896 to 1912, and one of the most prominent agriculturists of France. The Marquis was a member of the French Academy, and occupied many other important posts, including that of President of the French Red Cross. Throughout his life M. le Marquis de Vogüé showed a sincere and untiring devotion both to the science of agriculture and to the welfare of France. He had been an honorary member of the Royal Agricultural Society of England since 1899.

MR. RICHARD GEORGE CARDEN.

THE late MR. CARDEN was a prominent agriculturist in Ireland, and, although only a comparatively young man, took a leading part in the agricultural world. For a number of years he was a member of the Committee of Agriculture and the Horse Show Committee of the Royal Dublin Society, subsequently a member of the Council, and latterly was elected one of the Honorary Secretaries. He took a very keen interest in

the affairs of the Society, and always had its welfare at heart. Mr. Carden was a member of the Council of the Hunters' Improvement Society for many years, and became its President in 1910. He was elected on the Council of the Royal Agricultural Society of England in 1905, as the representative for the Division of Ireland, and was also a member of Council of the Shorthorn Society. Mr. Carden was a very successful breeder of hunter stock, winning not only at the principal shows in Ireland, but also at the Shows of the Hunters' Improvement Society. He acted as judge at Shows both at home and abroad, having officiated at the great Chicago Show in 1913, and at Johannesburg the following year.

Mr. Carden died at his residence, Fishmoynes, Templemore, Co. Tipperary, on July 7, 1916.

MR. JOHN HENRY HINE.

MEMBERS will learn with regret of the death on September 9, 1916, of Mr. John Henry Hine, of Pomphlett Farm, Plymstock, Plymouth. Mr. Hine, who was 53 years of age, had always been a healthy, active man, and was never known to complain of any illness until the actual day of his death. He succeeded his father at Pomphlett Farm, and took a most active share in the agriculture of the county, serving on a number of local committees. Mr. Hine became a member of the Royal Agricultural Society in 1891, and since 1905 he had represented Devon on the Council of the Society. He was also on the Council of the Devon Agricultural Association, and was a prominent member of the Devon Farmers' Union, the South Devon Herd Book Society, and the War Agricultural Committee.

MR. THOMAS HORROCKS MILLER.

THE late MR. T. H. MILLER, who died on May 2, 1916, became associated with the Society as a member in the year 1870, and was elected a member of the Council in the year 1884. During these years, and subsequently, he was a constant attendant at the Society's Annual Show, and from the year 1887, when the Show was held at Newcastle, till the year 1890 at Plymouth, he acted as a Steward of Stock.

He succeeded to the Singleton Estate in 1865, and at once devoted himself to the carrying on of the improvements on the

Estate, which had been commenced by his father. In a practical manner he set his neighbours an excellent example and provided them with the facilities for improving their Live Stock. For several years he took a great interest in Shire Horse Breeding and the influence of the Singleton Stud in the Fylde district remains as a tribute to Mr. Miller's foresight. He also kept Shorthorns and Jerseys, and a flock of Shropshire Sheep, which were all of excellent strains.

Mr. Miller was of a retiring disposition, but took the greatest personal interest in the welfare of his tenantry, and his village of Singleton was known as the "Model Village" of the Fylde.

Many Members and others connected with the Society will remember the very active part that Mr. Miller took in the organisation of the annual Police Sports, which for many years were held in the Showyard on the day after the closing of the Show. The enthusiasm he displayed on these occasions was undoubtedly conducive to the excellent feeling which has always existed between the Metropolitan and the County and Local Police generally during the visit of the Society to their particular city or town.

THE MANCHESTER SHOW, 1916.

WHEN the Council accepted the invitation of the Lord Mayor and Corporation of Manchester to hold its Annual Show in that city in 1916, there was then no indication that this country would be engaged in the greatest war that has ever been waged in the history of the world. Consequently, Manchester was the second War Show of the Society, and although it was held under great difficulties, the meeting from a practical utility point of view was undoubtedly a great success.

This was the third occasion on which the Society's Show had been held in Manchester, the first occasion being in the year 1869, when the late King Edward (then Prince of Wales) was President, and attended the Show accompanied by His Royal Consort. On that occasion Queen Alexandra paid her first visit to the City of Manchester.

The second Manchester Show was held in Trafford Park under the presidency of His Majesty King George, then Duke of York, in 1897, the year of the Diamond Jubilee of the late Queen Victoria.

Under the presidency of the Duke of Richmond and Gordon, K.G., the 1916 Show was opened on Tuesday, June 27, and was closed on Saturday, July 1. The site extending over about 120 acres was situated between the Alexandra Park Station and Withington, within three miles of the centre of the

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City of Manchester, and was easily accessible by tram car or by train. The land, which was particularly suited to the purposes of the Show, is the property of Lord Egerton of Tatton, to whom the Manchester Local Committee and the Society are greatly indebted for the provision of such a magnificent Showyard.

In consequence of the modifications required by the Ministry of Munitions there was no machinery in motion, and the Exhibition was limited to Machinery and Implements "strictly of the type generally used in a special form for purposes of Agriculture." Notwithstanding these restrictions the Implement Section included an excellent display of Farm Machinery and Implements, and the Judges report that when examining the new implements entered for Silver Medals, large numbers of visitors were present and evinced the greatest interest in the proceedings.

The conditions prevailing in the country prevented a large display of live stock, but the general impression was that for all round merit the Manchester Show compared very favourably with any of its predecessors.

The Board of Customs and Excise having decided that certain of the sections of the Show did not come within the meaning of "partly Educational or partly Scientific purposes," the payment of the Amusement Tax was enforced. Owing to the short time between the decision of the Authorities and the date of the Show, the Society undertook to defray the tax, and suggested certain arrangements for dealing with the payment, which were accepted by the Customs.

The Taxes imposed were—One Shilling on each Member of the Society attending the Show, and twopence on each person paying for admission to the Grand Stand at the Horse Ring, the Band Stand, Flower Show, and Dog Show.

The City of Manchester and the County of Lancaster gave the Society a most cordial welcome, and the Executive Committee, under the chairmanship of the Lord Mayor of Manchester, Alderman Smethurst, were indefatigable in carrying out their work in connection with the preparation of the Show ground.

It is a noticeable fact that since the formal invitation to hold the Show in Manchester was received, no less than four Lord Mayors have been identified with the undertaking. Of these the Society unfortunately has to deplore the deaths of Sir Walter Royse and Alderman Copeland. Sir Daniel McCabe and Alderman Smethurst are still actively engaged in the many important City affairs of Manchester.

Although during the week of the Show the weather was not as favourable as it might have been, the last two days being dreadfully wet, the total attendance was 149,197, as against

103,883 at Nottingham the previous year. The financial result of the Show was, however, very satisfactory, the excess of receipts over expenditure amounting to 4,481*l*.

Lancashire has now been visited by the Society on six occasions, and the following Table gives details of the attendances and entries at each of the Royal Shows held in the County. It is interesting to note that the financial results, with one exception, have been to the advantage of the Society.

Year	Place of Meeting	President	Implements entered	Entries of live stock	Persons paying for admission	Financial Result (+ = Profit — = Loss)
1841	Liverpool	Mr. Philip Pusey	312	324	(No record)	£
1869	Manchester	H.R.H. The Prince of Wales, K.G.	7,724	1,315	189,102	— 2,166 + 9,153
1877	Liverpool	Lord Skelmersdale (The Earl of Lathom)	6,930	1,292	138,354	+ 3,947
1897	Manchester	H.R.H. The Duke of York, K.G.	7,340	2,688	217,980	+ 4,074
1910	Liverpool	Sir Gilbert Greenall, Bt.	4,856	2,755	137,812	+ 5,483
1916	Manchester	The Duke of Richmond and Gordon, K.G.	2,300	2,338	149,197	+ 4,481

Tables are also given giving details of the admissions throughout the week and at the previous six Shows held, also the numbers of entries of Live Stock, Poultry, and Produce, and the space occupied by the Shedding in the Implement Yard.

The Plantations and Home Nurseries Competitions were again abandoned, and there was no Forestry Exhibition. It was also deemed advisable to give up the Farm Prize Competitions. There was an excellent exhibit by the Manchester University which is fully described in the "Notes, Communications and Reviews" section of this volume, p. 130.

A beautiful Show of Flowers was got together and the Championship Dog Show was held under the auspices of the National Terrier Club and the Manchester Dog Show Society.

A very interesting feature of the Show was the demonstration of women's work on the land, which was held on four acres of land allocated in the Showyard for the purpose. Twelve women took part, and carried on their work under the supervision of Mr. Galbraith, of the Knowsley Home Farm. Demonstrations were given daily on the Wednesday, Thursday and Friday, from 10 a.m. to 12.30 p.m., and from 2 p.m. to 5 p.m. The arrangements were carried out by the Cheshire County Committee, of which the Hon. John E. Cross was Honorary Secretary.

On Wednesday the Countess of Derby, Chairman of the Lancashire Committee, accompanied by members of both the County Committees, formally inspected the demonstration.

[Continued on page 154.]

(1) Admissions by Payment at Manchester, 1916.

Day of Show	11 a.m.	1 p.m.	3 p.m.	5 p.m.	Days total
Tuesday (5s.)	1,043	2,421	3,559	4,023	4,067
Wednesday (2s. 6d.)	5,007	13,881	23,646	28,473	29,145
Thursday (2s. 6d., after 3 p.m. 1s.)	7,767	19,856	30,971	36,309	36,938
Friday (1s.)	8,467	17,655	31,442	33,617	10,874
Saturday (1s.)	7,970	16,431	29,432	37,800	38,173
Total Admissions					149,197

(2) Total daily admissions at the 1916 Show, compared with the previous six Shows and the Manchester Show of 1897.

Prices of Admission	Manchester, 1916	Nottingham, 1915	Shrewsbury, 1914	Bristol, 1913	Doncaster, 1912	Norwich, 1911	Liverpool, 1910	Manchester, 1897
Judging day (5s.)	4,067	1,641	2,166	1,760	1,377	878	2,492	4,547
First half-crown day	29,145	12,321	12,566	21,632	10,780	7,140	19,646	22,418
Second half-crown day	38,938	30,798	19,317	31,155	18,914	20,442	30,193	21,473
First shilling day	40,874	26,034	39,397	78,702	39,254	75,266	44,327	79,119
Second shilling day	38,173	33,089	14,857	45,890	19,614	17,739	41,154	73,802
Totals	149,197	103,883	87,803	179,148	90,139	121,405	137,812	217,980 ^a

¹ After 5 p.m. the admission was one shilling.² After 3 p.m. the admission was one shilling.³ Including 22,621 on the third 1s. day.

Entries of Live Stock, Poultry, and Produce.

	Manchester, 1916	Nottingham, 1915	Shrewsbury, 1914	Bristol, 1913	Doncaster, 1912	Norwich, 1911	Liverpool, 1910	Gloucester, 1909	Manchester, 1897
Horses	1,515	1,500	1,819	1,584	1,773	1,716	1,698	1,599	981
Cattle	1,803	1,863	1,272	1,138	1,089	1,065	1,938	1,146	821
Sheep	607	575	1,886	736	734	746	772	1,802	649
Goats	92	—	—	—	—	—	—	—	52
Pigs	321	390	417	394	426	418	381	433	185
Total	2,338	2,297	3,394	2,852	3,023	2,943	2,757	2,980	2,684
Poultry	1,519	1,286	1,373	1,486	1,242	1,218	1,195	751	867
Produce	565	461	895	885	550	670	701	785	715

¹ Exclusive of Double Entries.² Exhibition of Cattle, Sheep and Pigs prohibited by order of Board of Agriculture

Shedding in Implement Yard.

Description of Shedding	Manchester, 1916	Nottingham, 1915	Shrewsbury, 1914	Bristol, 1913	Doncaster, 1912	Norwich, 1911	Liverpool, 1910	Gloucester, 1909	Manchester, 1897
Ordinary	Feet 3,300	Feet 4,835	Feet 6,610	Feet 6,870	Feet 7,050	Feet 6,690	Feet 7,590	Feet 7,575	Feet 9,320
Machinery	1,280	2,935	3,405	3,665	3,125	3,095	2,555	2,420	3,334
Special (Seeds, Models, &c.)	2,480	2,664	3,473	3,639	3,363	3,907	3,420	2,861	2,878
Total (Exclusive of open ground space)	7,070	10,704	13,488	14,224	13,538	13,692	13,565	12,856	15,532
No. of Stands	239	341	439	513	442	457	454	437	489

COMPARATIVE STATEMENT OF ENTRIES, ETC.,
AT THE TWO SHOWS HELD AT MANCHESTER IN 1897 AND 1916.

HORSES AND CATTLE	1897		1916		SHEEP, PIGS, POULTRY, PRODUCE	1897		1916	
	Classes	Entries	Classes	Entries		Classes	Entries	Classes	Entries
HORSES:—					SHEEP:—				
Prizes	—	£3 568	—	£2,786	Prizes	—	£1,375	—	£1,878
Shire	11	172	11	93	Oxford Down	5	37	5	38
Clydesdale	7	51	9	43	Shropshire	6	141	6	65
Suffolk	5	44	8	33	Southdown	5	74	6	63
Hunter	16	197	12	99	Hampshire Down	5	58	6	43
Polo Pony	8	95	5	34	Suffolk	5	18	6	23
Cleveland Bay or					Dorset Down	—	—	3	15
Coach Horse	8	40	2	7	Dorset Horn	2	10	4	15
Hackney	13	183	7	26	Ryeland	—	—	5	26
Hackney Pony	4	30	2	4	Kerry Hill (Wales)	—	—	3	17
Exmoor Pony	2	8	—	—	Lincoln	6	73	6	60
New Forest Pony	2	9	—	—	Leicester	6	80	4	14
Shetland Pony	2	15	2	19	Border Leicester	5	61	3	17
Welsh Pony	2	11	4	13	Wensleydale	2	21	6	21
Riding Classes	—	—	9	87	Lonk	2	7	3	14
Harness Classes	8	73	6	41	Derbyshire Gritstone	—	—	2	5
Pit Ponies	—	—	3	—	Kent or Romney	—	—	—	—
Agricultural Dray					Marsh	2	19	6	59
Horses	7	47	8	45	Cotswold	5	21	4	14
Turnouts	—	—	3	89	Devon	—	—	2	2
Jumping	—	—	5	86	South Devon	—	—	5	14
Total for HORSES	95	981	96	873¹	Dartmoor	—	—	3	9
CATTLE:—					Exmoor	—	—	3	5
Prizes	—	£2,105	—	£2,731	Cheviot	2	8	3	22
Shorthorn	7	184	13	176	Herdwick	2	15	3	12
Dairy Shorthorn	—	—	5	90	Welsh	2	17	4	30
Lincolnshire Red					Black-faced				
Shorthorn	—	—	8	12	Mountain	2	19	2	14
Hereford	7	60	8	61	Total for SHEEP	64	649	103	607
Devon	8	51	6	23	GOATS:—				
South Devon	—	—	4	19	Prizes	—	£49	—	£26
Longhorn	—	—	4	11		7	52	11	114
Sussex	6	25	5	22	PIGS:—				
Welsh	5	32	8	19	Prizes	—	£482	—	£762
Red Poll	5	38	6	42	Large White	4	46	8	77
Aberdeen Angus	5	46	6	47	Middle White	4	28	6	57
Galloway	5	29	5	15	Small White	4	12	—	—
Highland	2	3	—	—	Tamworth	4	30	6	23
Ayrshire	5	21	3	6	Berkshire	4	59	6	56
Bolstein-Friesian	—	—	6	55	Black	4	10	6	73
Jersey	8	149	8	77	Lincolnshire Curly-				
Guernsey	6	61	7	62	coated	—	—	6	35
Kerry	2	17	3	9	Total for PIGS	24	185	38	321
Dexter	2	27	3	25	TOTAL FOR STOCK	265	2,688	375	2,713
Dairy Cows	6	78	4	27	POULTRY:—				
Milk Yield	—	—	12	106	Prizes	—	£258	—	£488
Butter Test	—	—	3	69		92	837	152	1,519
Total for CATTLE	75	831	127	1,003¹	PRODUCE:—				
					Prizes	—	£406	—	£546
						37	715	90	565

Grand Totals for
LIVE STOCK, POULTRY, } 617 Classes . 4,802 Entries . £3,581 * Prizes
and PRODUCE in 1916. }

¹ Animals exhibited in more than one class are here counted as separate entries.

* Including £300 for Flower Show.

[Continued from page 151]

The Rt. Hon. A. F. Acland, of the Board of Agriculture, and Mr. Fitzherbert-Brockholes, of the Lancashire Committee, made short speeches on the employment of women in agriculture. There were also present Sir Sydney Olivier and Miss Talbot, of the Board of Agriculture, and Miss La Mothe, of the Board of Trade.

Another novelty which was a considerable attraction was the exhibit not for competition, made by Lady Egerton of Tatton, of three pens of Syrian Sheep and two pens of the St. Kilda breed.

As at Manchester, in 1897, classes for Goats were included in the Prize Sheet and attracted 92 entries. A parade of Donkeys, with the object of encouraging their owners to care for and treat them kindly, was arranged by Mr. Fred Hargreaves, the Secretary of the Band of Kindness, which has for its patrons the Lord Mayor, Bishop Welldon, and many other well-known citizens of Manchester.

Prizes were also offered for draught horses in gears and turnouts, including railway vans, and provided an excellent display.

The Exhibition of Bottled Fruits and Vegetables created considerable interest, but the Judge reported that nearly all the fruits bottled in water were too much cooked and generally the bottles were not full enough, and in some cases the fruit was too ripe. Asparagus was packed alternately one head up and one head down. The heads should always be uppermost.

On page 155 will be found a comparative statement of entries of the various breeds of Horses, Cattle, Sheep, Pigs, &c., at the Manchester Shows of 1897 and 1916.

It was unfortunately impossible for any Member of the Royal Family to visit the Show, but the Duke of Richmond and Gordon, K.G., President of the Society, was present throughout the week.

The President, at the General Meeting of Governors and Members in the Showyard on Wednesday, June 28, announced that His Royal Highness the Prince of Wales had consented to become a Governor of the Society, and the formal election of His Royal Highness was carried with acclamation.

The question of the price of this year's wool clip was discussed at the meeting, and a resolution was unanimously adopted calling the attention of the Government to the injustice to farmers entailed in the order prohibiting the sale of the 1916 clip, unless such prices are fixed as shall not be less than those ruling last year. This resolution was ordered to be communicated to the Government forthwith.

The Council had arranged for a series of auction sales to take place in the Manchester Showyard of live stock,

implements, poultry, produce, &c., in aid of the Agricultural Relief of Allies Fund, and these were carried out by the well-known auctioneers, Mr. Daniel Bradshaw, of Manchester, and Mr. Sam D. Walton, of Wilmslow, under the direction of the Steward of the Sales, Mr. A. C. Sparkes. The sales resulted in a gain to the fund of nearly 3,000*l*.

The Show was visited by many of the wounded soldiers from the various hospitals in the district, to whom the Council offered a cordial welcome.

The success of the Show was greatly due to the splendid work of the Local Committee and the Lord Mayor, and the City and County generally gave visitors to the Show a most hospitable reception.

To the Lord Mayor, Sir Daniel McCabe, Sir Edward Holt, Bart., and the Members of the City Corporation the thanks of the Society are due; and also to the Local Committee, of whom the Honorary Treasurer, Mr. G. Norris Midwood, Mr. J. T. Smith (Lord Egerton's Agent), and the Local Honorary Secretaries, Mr. Thomas Hudson (Town Clerk) and Mr. J. Herbert Hall devoted much time to the duties connected with the preparation of the Showyard, and with the local requirements generally. Owing to their services, the Honorary Director, Sir Gilbert Greenall, was enabled to have the Showyard complete in all respects at the time for opening in spite of the many difficulties created by circumstances arising out of the war. The City Corporation through their chief officials rendered the greatest assistance in many ways, more particularly with regard to the tram service, police arrangements in the vicinity of the Showyard, the planting of trees, shrubs and flowers round the ponds in the centre of the Showyard, and in the preparation of roads in and round the Showyard.

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MISCELLANEOUS IMPLEMENTS EXHIBITED AT THE MANCHESTER SHOW, 1916.

VERY great interest was shown by the public in the Implement Section of the Society's Show at Manchester, as evidenced by the numbers usually crowding round one or other of the newer or novel inventions.

The makers of some of these special machines scored somewhat owing to the absence of the machinery in motion section,

which is always popular, but owing to the war few makers could have exhibited, as their works are commandeered by the Government for making the thousand and one articles we so much need, all of which are included in the general term "munitions."

Agriculturists were especially looking out for a machine or machines which could in any way reduce the number of labourers required. For this reason there was always a crowd round the various mechanical milkers which, as an exception to the rule, were allowed to be in motion; one exhibit drawing particular attention, as they had two stuffed cows which they constantly milked, the milk being put into a hole in the back and used over and over again. Many thought they were living animals, and went on their way to the next stand. Perhaps, if the truth were told, I was deceived for a few moments myself, so realistic was the exhibit.

Owing to the scarcity of milkers these machines must come more and more in vogue, and many were the questions asked of the attendants by *bonâ fide* dairy farmers as to the feasibility of having an installation put up and the probability of its success. I wish one could recommend their general use, for otherwise more thousands of cows will be given up, in spite of the high price which the townsman thinks he pays for his milk.

It must be confessed that farming is not so well done now as before the war, which is evidenced by the miles of unmown thistles seen *en route* to the Show, on the pastures both permanent and temporary. Consequently thistle cutters were enquired for. Some are made which cut the flowering heads off, but many an acre is run over by the ordinary grass mower, an expensive process with a man and two horses, and only cutting five feet or less. Would that some firm could bring out an ordinary grass mower with a cutter bar at each side, having a ten foot span, and which could be set just the height not only to cut the thistles, but take the seed stalks off the grass, leaving the herbage intact.

Some of those who farm in the corn growing areas of the eastern counties, where five acres are arable and only one grass (on the average), well know the heavy labour required when dealing with the enormous bulk of straw that is grown on the larger farms. Great interest was therefore exhibited in the machines, which have been much improved of late, and which either press or bale the straw. It was asserted by some that large balers attached behind threshing machines were economical both in labour and straw, the convenient rectangular bales being more easily stacked, and not so liable to be wasted and damaged by rain as loose straw stacked from carrier.

There were only ten entries for the coveted silver medals at Manchester as against nineteen last year. In order of Implement Catalogue they were :—

No in Catalogue	Exhibitor's Name and Address	Nature of Implement
208	ASTLEY PATENT EGG BOX Co., Putney.	Egg Box.
358	WALKER, FRANCIS & SONS, Birmingham.	Horse Hoe and Drill Combined.
372	BALLARD, STEPHEN, Malvern.	Burning Machine.
373	" "	Scuffle.
473	DUNN, WALTER, & Co., Canterbury.	Drill.
810	LANG, W., Southwark Street, London.	Cream Separator.
1912	KETTLE, SAMUEL H., Manchester.	Chop or Chaff Mixer.
1917	RICHMOND & CHANDLER, LTD., Manchester.	Hay Sweep.
2133	BRISTOW, ALFRED, Wilberfoss.	Mechanical Manger.
227	BEACH CHEMICAL CO, Bridgnorth.	Sheep Maggot Fly Decoy.

Two of these were awarded the silver medal. The Astley Patent Egg Box Co., Putney, obtained a medal for their method of packing eggs on the suspension principle. Their entry, No. 208 in the catalogue, to hold six dozen eggs, was priced 8s. 6d., but they had all sizes on hand, both larger and smaller. Fig. 1 shows the method by which the eggs are so securely yet safely suspended by four hempen cords and separated from each other by water-proofed and antiseptic leather board. The eggs therefore are insulated as it were from each other and almost unbreakable even by rough usage when going by rail. One of the Judges threw a box a long distance on to the hard road, and on examination all the eggs were found intact and probably their hatching powers not much minimised. Fig. 2 shows an open box holding two dozen, a favourite size when dispatching a couple of sittings of eggs from the valuable strains of poultry so much in vogue at present. The makers assert that eggs have been kept in these trays from August to Christmas merely by keeping them in a temperature of 45° Fah., and turning the trays twice a week, after which they would boil and were not tainted, as is often the case, by flavours from the packing material. The Company also make Egg Testers by which a whole tray can be examined at once, also trays to insert into incubators, the tray being bodily turned, a great saving of labour.

The other medal was given to Messrs. Richmond & Chandler for their Hay Sweep (Cran's patent).

Labour saving machinery such as mowers, tedders, kickers, sweeps and hoists of every sort and kind have in my time greatly reduced the cost of winning an acre of hay. Provided your land is level and you can stack in the field or have gaps in the hedges of 15 ft., these hay sweeps will save more labour, and hard labour, than almost any other single implement.

Sweep rakes are not a new invention, but, being about 14 ft. wide, they are somewhat awkward to handle and to pack up for removal through an ordinary gate to another field. Messrs. Richmond & Chandler have much reduced these and other difficulties by their improvements as now exhibited. Fig. 3 shows the sweep ready for use. It will be noted that shafts are provided instead of draught poles; thus on arrival at the stack side the horses can the more easily back the machine free of its load of hay and set off for a fresh lot. The hand wheel near the driver's seat serves to adjust the height of the teeth and for lifting them some distance from the ground when fully loaded. Half a ton of weights were distributed over the rake in lieu of hay, and the driver on the seat almost balanced the loaded machine, a few turns of the wheel adjusting matters to a nicety. But the greater improvements are shown when the machine requires packing up for removal home or to another field. The attendant was given the machine as in Fig. 3 and in 5½ minutes, without help, changed it to the condition depicted in Fig. 5. This operation usually required several men. The hand wheel is used to elevate the tines, and a small jack, affixed, serves to lift the dead end, while the swivel wheel is adjusted to its new position for travelling. The spare shafts are then loaded up, and the seat turned, when all is then ready, as seen in the illustration, Fig. 5. Fig. 4 shows half a ton of hay on the sweep ready to go to the stack. The sweep was packed and unpacked many times during the Show and there was always an interested crowd looking on.

Messrs. Francis Walker & Sons had a Horse Hoe and Drill combined which they claimed would be useful for small holders.

Messrs. Stephen Ballard showed their Burning Machine which they had made for destroying the weeds between the rows of black currants, which they claimed they had done, without the use of a hoe. Fig. 6 shows the machine for the above work. The circular tank in the front holds eight gallons of petroleum, sufficient for one acre, at a high pressure. The five canisters behind contain inverted blow lamps, similar to those used by painters, but of course larger. They project a flame, intensely hot, on to the soil below, scorching up every weed on the surface, and, the makers assert, seed also. Such things as docks and twitch, I fear, will defy the operation. The flame would naturally spread out at the side, and perhaps thus destroy parts of the currant trees, but a slide which is up in Fig. 6 can be let down to the soil to avoid this. This machine, Fig. 6, has also been used to burn up the leaves of strawberries before ploughing them up.

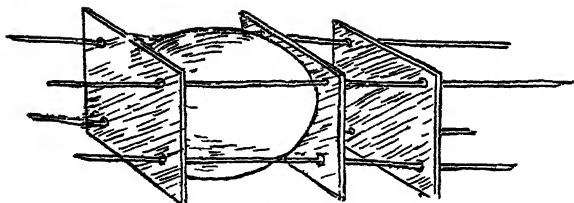


FIG 1—Detail showing the Astley safety method of egg suspension in their box

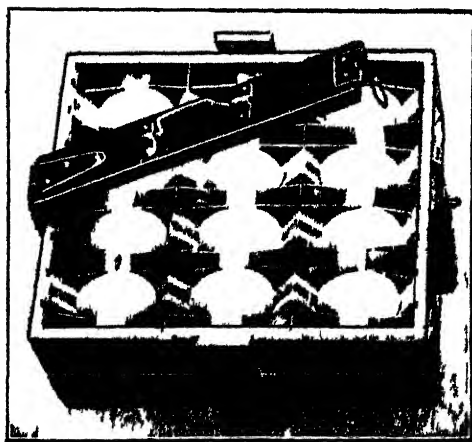


FIG 2—The Astley Safety Egg Box



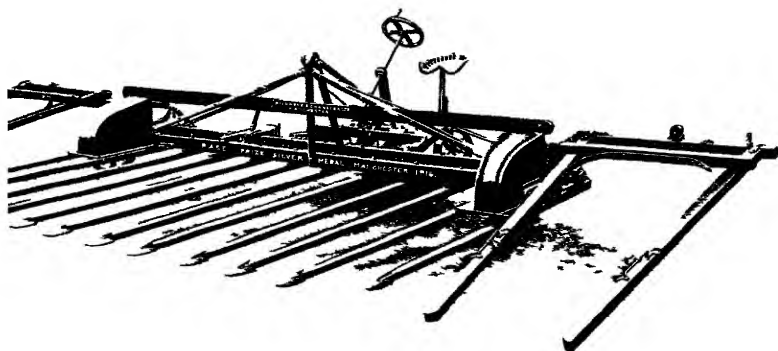


FIG 3—Richmond & Ohandler's Hay Sweep

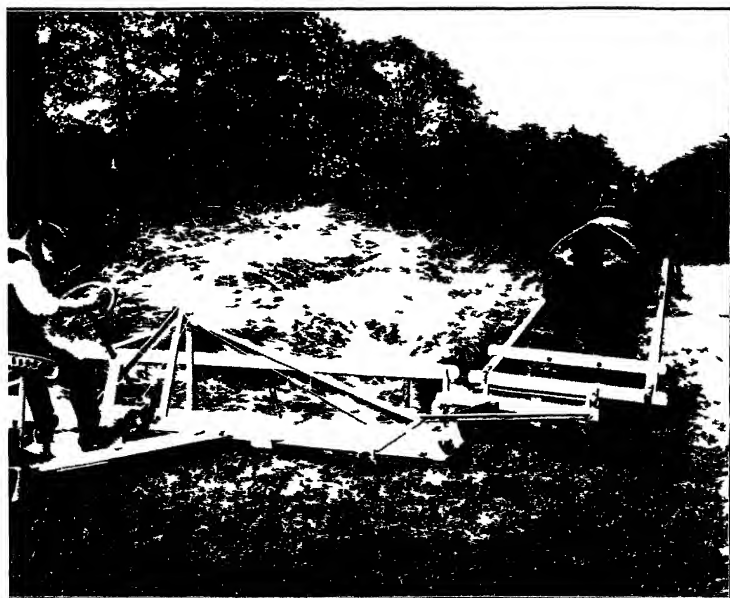


FIG 4—Richmond & Ohandler's Hay Sweep at work

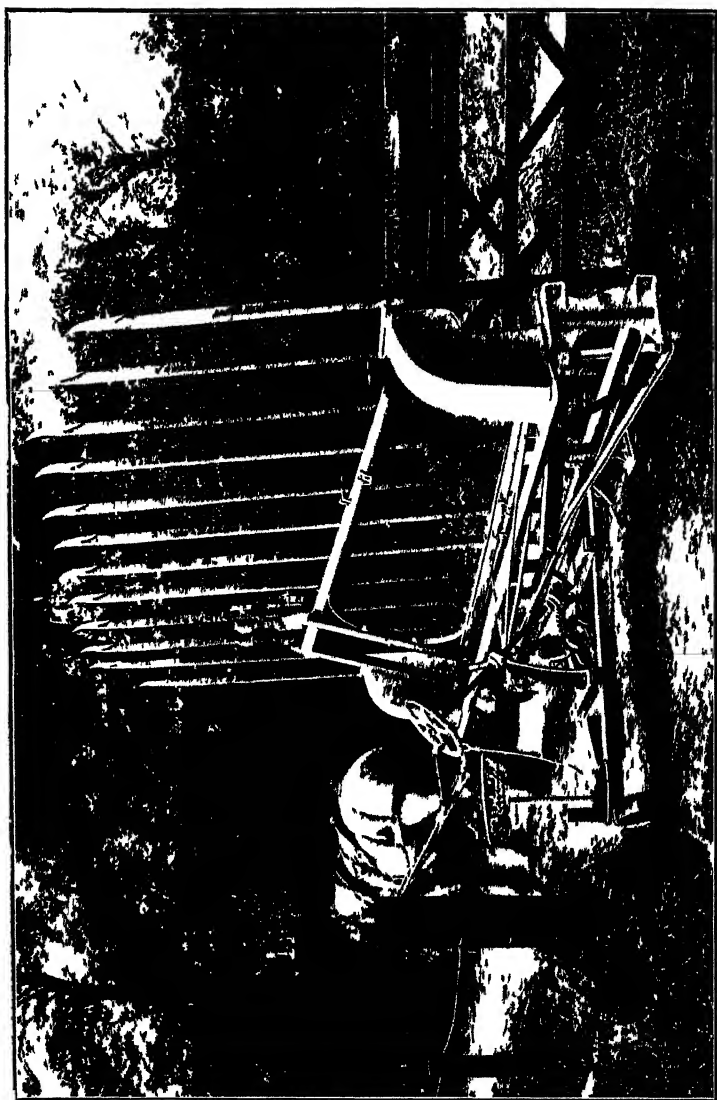


FIG 5.—The same Har Sweep packed by one man in $5\frac{1}{4}$ minutes for travelling

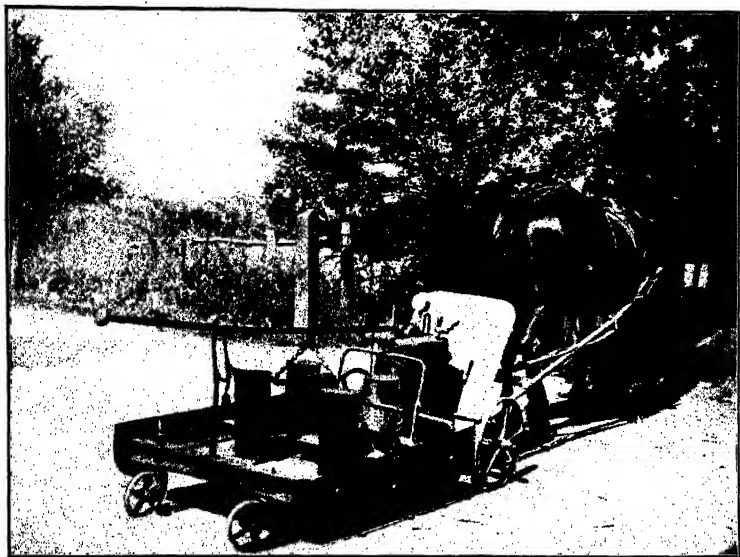


FIG. 6.—Ballard's large Burning Machine as used to destroy weeds between rows of black currant trees.



FIG. 7.—Ballard's small Burning Machine destroying weeds between rows of strawberries.

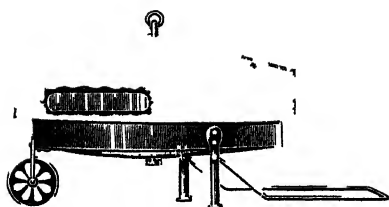


FIG 8—Beach & Sheep Maggot Fly Decoy

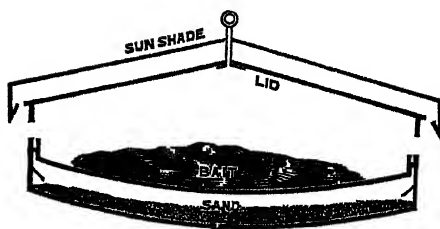


FIG 3—Details of Decoy

Fig. 7 shows a smaller machine destroying the weeds between rows of strawberries after the fruit has been picked. These machines are only in the experimental stage and are not on the market, but they may have a great future before them, especially if labour continues to be so scarce, though there are not a few obvious drawbacks attaching to their use.

Messrs. Stephen Ballard also showed a Scuffle to run down rows of fruit bushes, ingeniously using a breast made of canvas to plough as it were the overhanging branches aside, thus allowing the soil to be cultivated quite near to the roots.

Mr. Walter Dunn, of Canterbury, was most enthusiastic as to his drill for sowing wheat and manures in his special manner, and he certainly had resulting specimens of wheat surpassing anything on the stands of the Showyard. As the Railway Company failed to deliver all the parts in time for exhibition, this will be shown next year in competition for a medal, a certificate to that effect being granted.

The huge Chop or Chaff Mixer exhibited by Mr. S. H. Kettle would be of great use to a Railway Company or to others who keep a large number of horses.

Mr. Alfred Bristow's Mechanical Manger would probably enable a man to feed more cattle if his buildings were put up to suit the machine.

The Beach Chemical Company had quite a novel exhibit, which would be of great use if it would only act as the inventor claimed. He termed it a Sheep Maggot Fly Decoy, and its general appearance is depicted in Fig. 8, and in detail in Fig. 9. The machine is wheeled out to a field containing a flock of sheep, which in hot moist weather are very liable to be struck by the maggot fly. Bait, consisting of dead rabbit or any putrescent meat, is placed inside and then the lid and shade put on. The fly, scenting the bait, creeps inside to lay its eggs, which periodically are turned out into the sand below and destroyed afterwards. One machine was supposed to do for a 30-acre field, and would be a superior attraction to a dirty flock of sheep. The Judges were afraid that a flock of sheep, laid just behind a wood in hot thundery weather, and perhaps scouring a little, would prove a more irresistible morsel than the artificial decoy.

The thanks of the Judges are tendered to the Stewards of Implements, the Hon. J. E. Cross and Mr. R. M. Greaves, also to the Society's Consulting Engineer, Mr. F. S. Courtney, for their kind assistance and the attention they gave.

W. C. BROWN.

Appleby,
Doncaster.

REPORT OF THE STEWARD OF DAIRYING, MANCHESTER SHOW, 1916.

I.—FARMERS' MILK COMPETITION.

THE milks from 59 herds were tested for the prizes and certificates of merit offered by the Manchester Local Committee and the Royal Agricultural Society to farmers living in the counties of Lancashire and Cheshire, who supplied milk daily to Manchester, Salford, or to any place within a radius of four miles from Manchester Town Hall.

Owing to the difficulties of transport, and the shortness of labour in some districts, which only came to the knowledge of the Society a few days before the closing of the entries, the condition confining the competition to those who delivered milk twice a day was altered to allow those who were only able to deliver milk once in the day to compete, provided that the morning and evening meals of milk were kept in separate churns.

This undoubtedly affected the number of the entries, as the altered conditions did not come to the knowledge of all the farmers in the two counties.

The weather during the period from May 22 to June 22 was anything but normal, for the greater part of the time it was cold, sunshine was deficient, and the rainfall was more or less abundant, while thunderstorms were experienced on May 27 and June 9. The following particulars of the weather during the 22 days the competition lasted will be found interesting :—

Mean temperature	Rainfall.	Sunshine
54·0 Fahr.	2 91 inches.	141 1 hours

The regulations and conditions governing the points differed somewhat from those in force at Nottingham last year, the period for taking samples being extended, but in no case was a competitor aware of the date when the milk would be sampled.

The points were as under :—

4 points for every 1 per cent of fat			
2 points for every 1 per cent. of solids-not-fat			
20 points as a maximum for freedom from dnt.			
10 points	"	"	"
			slime

Milk containing less than 3 per cent. of fat or 8·5 per cent. of solids-not-fat, or not obtaining any points for freedom from dirt, or freedom from slime, in either of the morning or evening milks to be disqualified.

The points for freedom from dirt and slime were as follows:—

Dirt (parts—volume) per 100,000 parts.				
0 = not enough to measure and less than 0.5 . 20 points.				
More than 0.5 and less than	1.0	.	18	"
" 1.0 "	1.5	.	16	"
" 1.5 "	2.0	.	12	"
" 2.0 "	2.5	.	8	"
" 2.5 "	3.0	.	4	"
Above 3.0 disqualified.				

Slime (parts—volume) per 100,000 parts.				
Less than 5	10	points.		
More than 5 and less than 10	9	"		
" 10 "	8	"		
" 15 "	7	"		
" 20 "	6	"		
" 25 "	4	"		
" 30 "	2	"		
Above 35 disqualified.				

The prizes in Class 1, for competitors sending thirty-one gallons of milk and over daily, were won by:—

- 1st. MR. JOHN CLARKSON, Blakeley Farm, Mobberley, Knutsford.
- 2nd. MR. JOSIAH WALKDEN, Sunny Bank Farm, Mobberley, Knutsford.

The prizes in Class 2, for competitors sending in thirty gallons of milk and under, were won by:—

- 1st. MR. ALBERT LOMAS, Breck Head, Brownside, Stockport.
- 2nd. MR. JOHN G. SHERWIN, Vale Farm, Tabley, Knutsford.

Certificates of Merit were awarded to the following:—

Thomas Antwis, Merry Hall Farm, Lower Whitley, Northwich.
 Edmund S. Bailey, Park Brow Farm, St. Werburgh St., Chorlton-cum-Hardy.
 John James Bailey, Bank Top Farm, Sutton, Macclesfield.
 Samuel Bargh, Eddiford Bridge Farm, Clitheroe.
 Alfred T. Basford, Barnshaw Bank, Goostrey, Holmes Chapel.
 Herbert Beech, Smoker Hill Farm, Plumbley, Knutsford.
 William Booth, Oak Farm, Ringway, Altrincham.
 Joseph Brindley, Brownlow Farm, Congleton.
 William Brookes, Fields Farm, Kermincham, Holmes Chapel.
 John Callwood, Fir Tree Farm, Chelford, Cheshire.
 James Cooper, Lower Fold Farm, Hurdfield, Macclesfield.
 John Dale, Conksbury, Bakewell, Derbyshire.
 John Darlington, Morley Hall, Barrow, Chester.
 John Foden Dean, Newhall Farm, Over Peover, Knutsford.
 Ernest Dooley, Pale Farm, Henbury, Macclesfield.
 B. Dugdale & Son, Bowkers Farm, Waddington, Clitheroe.
 James Faulkner, Edge House Farm, Stretford, Manchester.
 Richard Foster, Ashen Bottom Farm, Ewood Bridge, Edenfield, Manchester.
 Peter Frith, Organsdale Farm, Kelsall, Chester.
 William Frith, Old Pale Farm, Kelsall, Chester.

[Continued on page 167.]

TABLE FARMERS' MILK COMPET. ON CLASS I.

No.	Daily Delivery of Milk	Temperature. ° Fah.		Fat per cent.		Solids-not-fat, per cent.		Points			Remarks	
		Morn-ing	Even-ing	Morn-ing	Even-ing	Aver-age	Aver-ing	Average Solids-not-fat, per cent. $\times \frac{1}{2}$	Freedom from Dirt	Freedom from Slime		Total
Gallons												
1	84	No	samples received	No	samples received	3.505	3.505	14.38	18.23	7.50	59.11	Cert. of Merit
2	33	56	53	56	53	3.77	3.77	15.08	17.78	7.00	58.86	Cert. of Merit
3	54	58	58	58	58	4.16	4.16	16.64	18.03	7.50	57.17	Cert. of Merit
4	40	58	58	58	58	3.535	3.535	14.14	18.31	7.50	52.95	Cert. of Merit
5	61	58	58	58	58	3.325	3.325	13.30	17.85	7.50	55.15	Cert. of Merit
6	51	58	58	58	58	3.36	3.36	15.84	17.85	8.00	49.02	Cert. of Merit
7	70	58	58	58	58	3.50	3.50	14.40	18.86	6.00	47.28	Cert. of Merit
8	34	58	58	58	58	3.72	3.72	14.34	18.42	7.50	57.26	Cert. of Merit
9	100	No	samples received	No	samples received	4.015	4.015	16.06	17.85	7.00	58.92	Cert. of Merit
10	34	56	53	56	53	3.865	3.865	16.32	18.23	8.00	60.53	First Prize
11	44	58	58	58	58	3.84	3.84	15.45	17.89	7.00	57.88	Cert. of Merit
12	56	58	58	58	58	3.885	3.885	13.54	17.89	4.00	53.36	Cert. of Merit
13	52	60	58	60	58	3.82	3.82	13.70	18.15	7.00	58.43	Cert. of Merit
14	125	60	58	60	58	3.425	3.425	15.12	19.13	8.50	58.35	Cert. of Merit
15	72	56	56	56	56	3.78	3.78	15.88	18.18	7.00	54.54	Cert. of Merit
16	45	54	56	54	56	3.965	3.965	15.96	18.24	7.50	58.25	Cert. of Merit
17	72	57	58	57	58	3.81	3.81	14.80	18.18	7.50	54.54	Cert. of Merit
18	45	54	56	54	56	3.70	3.70	14.80	18.24	7.50	58.54	Cert. of Merit
19	130	58	58	58	58	3.88	3.88	15.52	16.06	7.50	53.08	Disqual. (?)
20	130	58	58	58	58	3.70	3.70	12.56	17.88	7.00	53.44	Cert. of Merit
21	34	No	samples received	No	samples received	3.14	3.14	14.78	17.82	5.00	54.68	Cert. of Merit
22	36	62	54	62	54	3.80	3.80	15.86	17.72	7.50	56.80	Cert. of Merit
23	36	62	48	62	48	3.45	3.45	14.54	17.72	6.00	50.28	Cert. of Merit
24	80	54	52	54	52	3.75	3.75	14.00	16.08	7.50	52.48	Disqual. (*)
25	80	56	54	56	54	3.50	3.50	13.74	17.42	2.00	41.16	Disqual. (*)
26	80	62	62	62	62	3.46	3.46			Nil. in even. milk		
27	59	60	63	60	63							
28	36											
29	50	56	55	56	55	3.89	3.89	14.28	17.78	7.50	57.66	Cert. of Merit

(1) Morning sample, Solids-not-fat, below 2.5 per cent.

(2) Evening sample, Solids-not-fat, below 8.5 per cent.

(*) Evening sample, Excess of Slime, no points.

TABLE I.—FARMERS' MILK COMPETITION—continued.
CLASS I.—continued.

No.	Daily Delivery of Milk	Temperature, ° Fah.		Fat per cent.		Solids-not-fat, per cent.		Points				Remarks
		Morn-ing	Even-ing	Morn-ing	Even-ing	Aver-age	Morn-ing	Aver-age	Freedom from Dirt	Freedom from Shine	Total	
30	Gallons	56	52	3.15	3.60	8.75	9.11	8.84	20.00	5.00	56.18	Cert. of Merit
31	34	54	38	3.57	4.12	8.45	9.11	8.93	18.00	8.00	59.24	Cert. of Merit
32	78	58	36	3.11	4.40	8.80	8.96	8.87	18.00	8.00	58.64	Cert. of Merit
33	84	58	54	3.40	3.56	8.95	9.21	9.08	18.00	8.00	51.64	Cert. of Merit
34	62	57	63	3.58	3.40	8.74	9.10	8.97	18.00	8.00	59.60	Cert. of Merit
35	90	60	60	3.31	3.60	8.55	8.96	8.95	18.00	7.00	51.78	Cert. of Merit
36	120	58	57	3.43	3.32	8.76	8.66	8.85	18.00	7.50	57.09	Cert. of Merit
37	62	58	58	3.41	3.19	8.30	8.63	8.85	18.00	6.50	55.89	Cert. of Merit
38	60	56	58	2.77	3.14	8.55	8.36	8.92	17.00	7.50	58.90	Disqual. (1) (2)
39	50	62	62	3.16	3.55	8.93	9.43	9.16	18.00	8.00	57.74	Cert. of Merit
40	64	58	58	3.06	3.55	8.89	9.21	9.23	18.00	5.50	59.94	Cert. of Merit
41	70	58	58	3.38	3.96	8.47	8.77	10.29	18.00	5.50	58.12	Cert. of Merit
42	70	60	61	3.31	3.68	8.45	8.96	9.22	18.00	7.00	54.93	Cert. of Merit
43	63	53	53	3.55	4.40	8.75	8.76	8.97	18.00	7.00	58.84	Cert. of Merit
44	43	58	50	3.12	4.29	8.75	9.33	8.97	18.00	7.50	58.93	Cert. of Merit
45	95	53	56	3.11	3.83	8.47	9.09	9.05	18.00	7.50	54.78	Cert. of Merit
46	50	58	58	3.21	3.90	8.88	8.97	9.06	18.00	5.50	49.85	Cert. of Merit
47	39	60	80	3.34	4.55	8.45	8.71	8.88	12.00	8.50	60.04	Second Prize
48	40	60	64	3.58	3.86	8.73	8.98	9.12	18.00	4.00	55.12	Cert. of Merit
49	42	58	62	3.11	4.09	8.60	8.88	8.79	19.00	8.00	59.07	Cert. of Merit
50	50	58	58	3.11	3.83	8.83	9.21	9.38	14.00	7.00	57.92	Cert. of Merit
51	110	65	58	3.61	3.90	8.35	9.43	9.05	18.00	8.00	58.93	Cert. of Merit
52	48	No samples received	No samples received	No samples received	No samples received	No samples received	No samples received	No samples received	No samples received	No samples received	No samples received	No samples received
53	180	56	53	3.41	3.83	8.62	8.91	8.89	16.00	7.50	55.76	Cert. of Merit
54	38	53	53	3.41	3.83	8.62	8.91	8.89	16.00	7.50	55.76	Cert. of Merit
55	52	53	53	3.41	3.83	8.62	8.91	8.89	16.00	7.50	55.76	Cert. of Merit
56	52	53	53	3.41	3.83	8.62	8.91	8.89	16.00	7.50	55.76	Cert. of Merit
57	52	53	53	3.41	3.83	8.62	8.91	8.89	16.00	7.50	55.76	Cert. of Merit
58	52	53	53	3.41	3.83	8.62	8.91	8.89	16.00	7.50	55.76	Cert. of Merit

(1) Morning sample—Fat below 3 per cent.

(2) Morning sample—Solids-not-fat below 8.5 per cent.

TABLE I.—FARMERS' MILK COMPETITION—continued.
CLASS II.

No.	Daily Delivery of Milk	Temperature, ° Fah.		Fat per cent.			Solids-not-fat, per cent.			Points				Remarks	
		Morn- ing	Even- ing	Morn- ing	Even- ing	Aver- age	Morn- ing	Even- ing	Aver- age	Average Fat per cent. $\times \frac{1}{4}$	Average Solids-not-fat, per cent. $\times \frac{1}{2}$	Freedom from Dirt	Freedom from Slime		Total
60	Gallons 24	53	56	3.33	3.81	3.57	9.37	9.51	9.44	14.28	18.88	13.00	6.60	52.76	Cert. of Merit
61	23	61	62	3.46	4.33	3.895	8.92	9.33	9.125	15.58	18.25	18.00	7.00	58.83	Cert. of Merit
62	28	56	56	3.06	4.50	3.78	9.03	9.21	9.12	15.12	18.24	19.00	8.50	60.88	First Prize
63	24	57	54	3.80	3.84	3.82	9.03	9.25	9.125	15.28	18.25	12.00	5.50	51.03	Cert. of Merit
64	18	56	54	3.76	3.03	3.395	8.82	8.87	8.845	13.58	17.69	18.00	4.00	55.27	Cert. of Merit
65	26	58	56	3.85	3.33	3.59	8.97	9.04	9.005	14.36	18.01	19.00	7.50	58.87	Second Prize
66	24	85	58	4.21	4.02	4.115	9.17	9.30	9.235	16.46	18.47	13.00	5.00	52.93	Cert. of Merit
67	30	53	51	3.17	3.70	3.435	9.91	9.28	9.595	13.74	19.19	18.00	7.50	58.43	Cert. of Merit

[Continued from page 163]

S. J. Hague, Mollards Farm, Gawsorth, Macclesfield.
 Henry Hocknell, Heywood Farm, Audlem, Cheshire.
 John Thomas Hocknell, Hollins Farm, Holmes Chapel.
 William Hocknell, Cranage, Holmes Chapel.
 William Horton, Marton Villa, Winsford, Cheshire.
 William Hudson, Over Winsford, Cheshire.
 John Richard Lowe, Wheelock Farm, Sandbach, Cheshire.
 Thomas Massey, Intakes Farm, Rushton, Macclesfield.
 Isaac Whittaker Mayer, Old Hall Farm, Withington, Manchester.
 William Henry Mayer, Baguley Hall, Altrincham.
 Edward Melling, The Grange, Dunckley, Blackburn.
 Joseph Ollier, Hollins Farm, Bosley, Macclesfield.
 George Parker, Howgill, Rimington, Clitheroe.
 G. and W. Parker, Little Middup, Gisburne, Clitheroe.
 John Payne, Tyre Farm, Mickle Trafford, Chester.
 Randolph W. Platt, White House Farm, Plumbley, Knutsford.
 John Ravenscroft, Moss Farm, Plumbley, Knutsford.
 Joseph Robinson, Aston-by-Budworth, Northwich.
 F. L. Rowland, Brook Farm, Astle, Chelford.
 Ralph Seed, Whymond Houses, Pendleton, near Clitheroe.
 John James Sproston, Astle Farm, Chelford, Cheshire.
 George Stanier, Brook Farm, Marthall, Knutsford.
 John Stanier, Holly Farm, Marthall, Knutsford.
 John E. Starkey, Sandfield Farm, Middleton, Lancashire.
 Fred Steel, Blue Bell Farm, Knutsford, Cheshire.
 C. W. Tomkinson, Willington Hall, Tarporley.
 William Venables, Dingle Bank, Chelford, Cheshire.
 Frank T. Walley, Tilstone Bank, Tarporley.
 Henry Wallworth, Upton Hall Farm, near Macclesfield.
 John Thomas Webb, Bradley Mount Farm, Butley, Macclesfield.
 E. and P. Wild, Hockerley Hall, Whaley Bridge.
 Thomas Wilkinson, Great Mearley Farm, Mearley, Clitheroe.
 Albert N. Willis, Houdslough, Kingswood, Frodsham, Warrington.

The quality of the milk is shown by the following average figures :—

No. of herds	Daily milk delivered	Average fat per cent.	Average solids-not-fat per cent.
59	3397 gallons	8.65	9.03

the averages of the morning and evening milk being as below—

	Fat per cent.	Solids-not-fat per cent.
Morning . . .	8.45	8.99
Evening . . .	8.85	9.07

In only one case was the milk deficient in fat and solids-not-fat. In two other cases the solids-not-fat did not reach 8.5 in one milking, while only one sample was disqualified for "excess of slime" in the milk.

That the milk generally was of excellent quality is shown from the above figures, and also by the large number of certificates of merit awarded, 55 out of 59 competitors obtaining honours.

This latter speaks for itself, and shows that the Corporation of Manchester may well be proud of its milk supply, largely owing to the fostering care of the Public Health Department,

TABLE II.—MILK-YIELD CLASSES AT MANCHESTER, 916.

No. in Catalogue	Exhibitor	Name of cow	Date of birth	Date of last calf	No. of days in milk	Date of last Service	Total milk yield in 24 hours	Aver- age Per- cent. age	Points			Awards	
									Milk	Loca- tion	Total		
Class 203		Shorthorns		1916									
689	G. Kelsey Burpee.	Lady Thrusd 3rd	May 20, 1907	Feb. 28	122	May 17, 1916	Lb. oz.	57	0	595	820	81'00	3rd Prize.
687	R. W. Hobbs & Sons	Dulce 8th	Mar. 21, 1909	Apr. 14	Absent	Absent	—	—	—	—	—	—	—
685	R. W. Hobbs & Sons	Rose 43rd	Sept. 17, 1907	June 23	Absent	Absent	—	—	—	—	—	—	—
689	Maj. E. F. Holden	Birdsall Lady Geneva 6th	Mar. 12, 1908	—	9	—	54	12	4'02	54'75	18'08	Nil	H.C.
700	Lord Lucas.	Primrose Gift	Mar. 29, 1908	June 20	32	—	56	0	5'46	58'00	13'84	Nil	H.C.
701	Lord Lucas.	West Planet 2nd	July 28, 1910	May 28	46	—	60	8	5'03	69'60	12'12	80	2nd Prize.
703	R. L. Mond.	Johnny Rose 10th	Dec. 12, 1907	May 14	4	—	63	4	5'17	63'25	20'68	Nil	1st Prize.
706	G. B. Nelson & Sons	Proud Strawberry	May 20, 1909	June 25	24	—	49	8	5'32	49'50	15'28	Nil	H.C.
707	H. H. Owtram	Newland Poppy 6th.	July 8, 1907	June 5	14	—	55	10	5'10	55'62	20'40	Nil	H.C.
708	H. H. Owtram	Wallflower 9th.	Aug. 2, 1908	June 15	84	—	40	4	5'28	40'25	13'12	4'40	57'77
709	Maj. W. N. Pilkington	Aughton Janette.	Oct. 6, 1908	Apr. 6	63	—	46	14	5'08	46'87	11'92	1'30	Below Fat Standard.
710	Maj. W. N. Pilkington	Dinah 1th	Mar. 21, 1908	May 7	35	—	51	0	5'75	51'00	15'00	Nil	H.C.
714	Sir John O.S.Thursby, Bart.	Ronan Buttery.	Jan. 25, 1910	May 25	54	—	53	4	5'77	53'25	15'08	1'40	68'73
715	Sir John O.S.Thursby, Bart.	Rosebud 8th	Sept. 20, 1908	May 6	17	—	44	12	2'78	44'75	11'12	Nil	Below Fat Standard.
717	J Timberlake	Heartsease	Aug. 2, 1909	June 12	31	—	62	14	4'50	62'87	18'00	Nil	H.C.
718	Capt. A. S. Wills	Duchess of Oranford 3rd	Oct. 20, 1908	May 28	61	—	47	0	5'28	47'00	15'12	2'10	69'22
719	Capt. H. Fitzherbert-Wright, M.P.	Darlington Oranford 68th	Jan. 14, 1911	Apr. 29	22	—	56	8	5'40	56'50	13'60	Nil	H.C.
724	R. L. Mond.	Coral Belle.	Mar. 5, 1912	June 7	31	—	38	12	4'27	38'75	17'08	Nil	—
731	The Lord Wanda- worth Institution	Primrose 25th	Oct. 5, 1912	May 29	44	—	59	10	2'90	59'62	11'60	40	51'62
733	The Duke of West- minister	Rosemund Rose	Mar. 30, 1912	May 16	54	—	42	12	5'75	42'75	15'00	1'40	59'15
735	Capt. A. S. Wills	Puddington Lady York	July 2, 1912	May 6	54	—	56	0	5'80	56'37	15'20	1'40	73'97
736	Capt. A. S. Wills	Victoria 2nd	Apr. 2, 1912	May 6	101	—	28	4	5'30	28'25	13'20	5'00	46'45
739	Godfrey Fitz-Hugh	Plas Power Buttery	May 14, 1913	Mar. 20	Absent	—	53	0	5'38	53'00	13'62	2'80	69'12
751	The Lord Wanda- worth Institution	Synl.	July 2, 1913	May 23	68	—	56	4	5'35	56'25	13'40	2'90	73'55
Class 204		Lincoln Red Shorthorns											
784	John Evens.	Burton Fox 5th.	Nov. 9, 1909	Apr. 24	23	—	50	0	2'68	50'00	10'32	2'80	69'12
785	John Evens.	Olifton Beauty.	March, 1907	Apr. 21	68	—	56	4	5'35	56'25	13'40	2'90	73'55
796	Newton, Chambers & Co., Ltd.	Cockerington Cowlip	Feb., 1911	June 6	23	—	50	0	2'68	50'00	10'32	Nil	Below Fat Standard.

TABLE II.—MILK-YIELD CLASSES AT MANCHESTER, 1916—continued.

No. in Catalogue	Exhibitor	Name of cow	Date of birth	Date of last calf	No. of days in milk	Date of last Service	Total milk yield in 24 hours	Average Fat per cent. age	Points			Awards	
									Milk	Fat per cent. $\times 4$	Lactation Total		
<i>Class 204</i>													
824	S. Blundell	Lincoln Reds—continued.	May, 1909	1916	63	—	130	8	2.65	60.50	10.60	230	Below Fat Standard.
825	S. Blundell	Bendish Cherry	Apr. 27	—	83	—	58	8	2.65	60.50	10.60	230	1st Prize.
826	S. Blundell	Bendish Dorothy	Apr. 6	—	84	—	56	4	2.67	60.25	14.08	440	3rd Prize.
827	John Evans	Burton Fulwell 2nd	May 18	—	42	—	55	4	4.50	55.25	18.00	20	2nd Prize.
828	John Evans	Shervood No. 24	June 6	—	23	—	62	2	3.50	62.12	15.20	NII	—
829	Newton, Chambers & Co., Ltd.	Lackham Peary 3rd	Aug. 1, 1913	June 15	14	—	—	—	—	—	—	NII	—
<i>Class 205</i>													
835	John H. Chick	Devons	June 23, 1907	Apr. 14	76	—	90	0	3.00	30.00	12.00	360	—
836	John H. Chick	Compton Quality 2nd	Apr. 1	—	89	June 9, 1916	40	8	5.83	40.50	15.40	490	1st Prize.
837	R. A. Clarke	Wynford-Wynford	May 12	—	48	—	45	0	3.45	45.00	13.80	80	2nd Prize.
838	R. A. Clarke	Cherry 1st	May 14	—	46	—	39	12	4.17	39.75	16.68	160	—
839	Loram Bros.	Maud Royal	May 4	—	56	—	37	4	3.60	37.25	14.40	70	—
840	Loram Bros.	Darling	May 4	—	56	—	37	4	3.60	37.25	14.40	70	—
841	Loram Bros.	Debit	Apr. 20	—	70	—	23	4	3.55	23.25	14.20	90	—
842	Loram Bros.	Gentle 1st	May 6	—	64	—	39	2	3.52	39.12	14.08	140	—
843	Loram Bros.	Orange	Mar. 23	—	88	—	41	4	3.25	41.25	13.00	500	3rd Prize.
<i>Class 206</i>													
910	Pago & Whitley	South Devons	May 12, 1906	June 15	14	—	62	10	4.15	62.62	16.00	NII	1st Prize.
911	Pago & Whitley	Hilda 3rd	July 10, 1906	June 1	28	—	69	0	5.72	69.00	14.88	NII	3rd Prize.
912	W. & H. Whitley	Milkmaid	Nov. 23, 1910	June 9	20	—	62	12	3.82	62.76	15.28	NII	2nd Prize.
<i>Class 207</i>													
935	W. Hanson Sale	Longhorns	Apr. 24, 1910	June 17	12	—	48	10	4.25	48.62	17.00	NII	1st Prize.
<i>Class 208</i>													
944	Kenneth M. Clark	Red Fells	Sept. 13, 1910	Apr. 18	72	June 3, 1916	47	8	3.50	47.60	14.00	320	2nd Prize.
945	Kenneth M. Clark	Sudbourne Ketch	Sept. 30, 1909	Apr. 26	64	May 16, 1916	38	12	3.55	38.75	14.20	240	—
946	Kenneth M. Clark	Sudbourne Russett Belle 2nd	Aug. 16, 1908	Mar. 11	110	May 10, 1916	66	6	5.65	56.57	14.60	700	1st Prize.
<i>Class 209</i>													
1002	Alexander Cross	Ayrshires	Apr. 15, 1908	June 6	23	—	50	0	4.57	50.00	18.28	NII	2nd Prize.
1003	William Gibson	Knockdon Diana	Mar. 13, 1910	June 5	24	—	61	2	5.50	61.12	14.00	NII	1st Prize.
<i>Class 210</i>													
1108	Mrs. T. E. Brooks	Holstein, Friesians	Mar. 12, 1909	May 18	42	—	46	14	3.12	46.87	12.48	20	58.55
1109	A. & J. Brown	Meadowend Pearl	1906	May 17	43	—	64	0	3.62	64.00	14.48	30	78.78
1112	Richard Ford	Park Buttercup	Feb. 25, 1912	May 17	43	—	54	8	5.85	54.50	14.80	30	69.40
1114	Maj. G. B. Powell	Eake Flower	Jan. 23, 1909	May 30	80	—	47	12	5.02	47.76	15.68	NII	3rd Prize.

TABLE II.—MILK-YIELD CLASSES AT MANCHESTER, 1916—continued.

No. in Catalogue	Exhibitor	Name of cow	Date of birth	Date of last calf	No of days in milk	Date of last Service	Total milk yield in 24 hours	Aver. fat per cent.	Points		Awards	
									Milk	Lactation		
<i>Jerseys</i>												
<i>Class 211</i>	Grosvenor Barry	Nimrod's Dinah	July, 1908	1916	188	Apr. 23, 1916	44 25	20.00	980	75.85	2nd Prize.	
1166	Mrs. Bradish-Elmham	Lady Marysore.	Dec. 27, 1912	Dec. 15, 1916	197	May 12, 1916	35 12	18.80	400	57.92	H.C.	
1167	Miss Enderby	Dandy May	Dec. 8, 1911	Apr. 7	83	June 1, 1916	40 10	5.72	180	89.80	H.C.	
1170	W. M. Jackson	Pretty Victress.	Nov. 6, 1910	May 2	53	—	38 14	4.62	88.87	18.08	H.C.	
1171	A. Miller-Hallett	Cowslip 48th	Jan. 3, 1911	May 2	53	—	34 14	4.15	94.87	18.60	H.C.	
1173	A. Miller-Hallett	Goddington Franchise	Apr. 3, 1912	Apr. 25	101	Apr. 30, 1916	42 0	4.97	43.00	19.68	H.C.	
1174	A. Miller-Hallett	Mentora 6th	Mar. 3, 1908	Mar. 20	85	—	35 25	17.38	260	64.38	H.C.	
1176	J. H. Smith-Barry	Nerine	Oct. 3, 1904	Apr. 5	68	May 23, 1916	51 2	5.46	61.12	21.30	1st Prize.	
1180	C. Thellusson	Wexford's Daisy	Apr. 23, 1908	Feb. 5	145	—	28 12	5.10	28.75	20.40	—	
1184	Lady Wernher	Bombay's Pet 4th	Apr. 20, 1910	June 8	21	—	33 2	4.30	33.12	17.20	—	
1186	Lady Wernher	Carlsbad	Mar. 30, 1911	May 24	56	—	36 12	4.82	38.75	19.28	3rd Prize.	
1187	G. H. Bravington	Goddington Flower 4th.	Dec. 4, 1907	Mar. 19	71	May 23, 1916	37 8	5.22	37.50	20.68	—	
1193	J. H. Smith-Barry	Prestige	Apr. 6, 1913	Apr. 19	102	—	30 10	5.28	19.25	21.12	H.C.	
<i>Class 212</i>			Mar. 12, 1913	Feb. 3	147	Apr. 14, 1916	30 10	4.48	30.62	17.62	10 70	59.24
1230	Mrs. Lionel Corbett	Lake Billie	June 23, 1909	Apr. 18	72	May 6, 1916	29 4	4.42	30.62	17.68	30	51.50
1234	A. W. Bailey Hawkins	Rose Point of Stagenhoe	Nov. 8, 1908	Apr. 14	46	—	29 4	4.60	29.25	18.00	60	47.85
1236	A. W. Bailey Hawkins	Stagenhoe Rose of Gold 1st	Nov. 20, 1910	Apr. 28	62	—	40 4	4.80	40.25	18.40	220	69.85
1240	J. F. Remnant, M.P.	Dominion Jane	Nov. 14, 1909	May 5	55	—	46 2	4.42	48.12	17.98	150	65.30
1241	J. F. Remnant, M.P.	Lemon Queen 3rd	May 28, 1910	Apr. 23	67	—	35 2	3.75	35.12	15.00	870	63.82
1242	J. F. Remnant, M.P.	Orchard and 2d of Blunham	Aug. 8, 1911	Feb. 27	93	June 7, 1916	39 2	4.07	35.12	16.28	300	63.40
1243	E. J. Wyles	Lola 3rd of Warren Wood	July 4, 1900	Mar. 25	96	June 7, 1916	33 0	4.02	39.00	16.08	580	54.68
1245	A. W. Bailey Hawkins	Stagenhoe Daisy 1st	Feb. 6, 1913	Apr. 7	123	—	36 4	3.85	38.25	15.40	350	55.15
1248	J. F. Remnant, M.P.	Romana 48th	Feb. 15, 1912	Apr. 15	75	—	36 4	3.85	38.25	15.40	350	55.15
<i>Class 213</i>												
1274	S. J. Brown	Gort Dainty 3rd	Mar. 8, 1908	May 9	51	June 19, 1916	42 12	4.05	43.75	16.20	110	69.05
1276	S. J. Brown	Maid of Ard Caen	Feb. 20, 1910	May 13	42	—	37 4	4.40	27.25	17.60	220	49.05
1276	T. E. Clarke	Wyresdale Thistle	June 24, 1908	May 10	50	—	34 14	3.90	34.87	17.40	NH	49.47
1277	Mrs. E. Royds, M.P.	Caythorpe Jewel	July 24, 1908	May 10	50	—	32 2	3.76	32.12	15.00	100	49.12
<i>Class 214</i>												
1286	H.M. The King	Dinah	1907	May 14	46	—	44 0	4.52	44.00	18.08	70	63.68
1286	H.M. The King	Dusky	1910	May 19	41	—	38 2	3.46	35.12	13.80	20	53.02
1288	H. Martin Gibbs	Barrow Bee 2nd	Aug. 23, 1910	May 9	51	—	38 10	4.25	38.62	17.00	110	46.72

and to the pains taken by the dairy farmers of Lancashire and Cheshire to see that the milk sent to the city for consumption should be up to the so-called milk standard, and free from dirt.

The collection of the samples of milk for analysis was undertaken by Dr. James Niven, who also supplied the most elaborate notes on the weather, from which the figures quoted above are taken, while the whole of the chemical and microscopical work was carried out under the personal superintendence of Professor Delépine.

The examination of the fats and solids-not-fat were made by gravimetric methods, the results obtained thereby being free from the errors that are inherent to the quicker processes.

To Dr. Niven, to the Corporation of Manchester, and to Professor Delépine the thanks of the Society are due, the work entailed in analysing the milk, and estimating the quantities of dirt and slime being particularly heavy.

II.—MILK-YIELD TRIALS (CATTLE).

Although the entries for these competitions reached a total of 110, the actual number of animals which were milked out on Wednesday evening, June 28, was only 77, the difficulties of transport and the shortage of labour accounting for a large number of absentees.

With one slight exception, the points governing these and the Butter Test trials were the same as those at Nottingham, the only difference being the limitation of 2 points as a maximum for lactation where a cow had calved 121 to 150 days without being mated.

Table II. on pp. 168-70 gives the full details of the trials and the prizes and commendations awarded in the different classes.

Table IV. on page 174 gives the average results of all the cattle tested under their respective breeds.

Six animals were disqualified for giving milk deficient in fat as follows :—

3 Shorthorns	out of 20 sampled
2 Lincoln Red Shorthorns	" 7 "
1 Kerry	" 4 "

Attention must be called to the case of the winning Shorthorn cow. She took first prize in the Milk Yield Class, and the two first prizes in the close and open Butter Test Classes.

Her yield of milk was 63 lb. 4 oz., showing 5·17 fat, while in the Butter Test Classes her milk made 3 lb. 7 oz. of butter.

It appears from the particulars given that she had only been calved 4 days, so that the above figures cannot be considered normal.

TABLE III.—RESULTS OF BUTTER TESTS AT MANCHESTER, 1916.
CLASS 215.—SHORTHORN COWS IN MILK EXCEEDING 900 LB. LIVE WEIGHT.

No. in Catalogue	Exhibitor	Name of cow	Breed	Live weight	Date of birth	Date of last calf	No. of days in milk	Date of last service	Milk yield in 34 hours	Butter yield	Ratio.	Colour and quality of butter		No. of points for butter	No. of points for period of lactation	Total No. of points	Awards	CHURNING TABLE				
												Colour	Quality					Beginn	Finished	Duration (minutes)	Dairy	Cream and churn	Temperature, ° F.
695	R. W. Hobbs & Sons	Dulac 8th	Shorthorn	Ab sent		1916			54 12	2 8	27.02	Fair	Fair	35.00	N1	35.00	H. O.	10 41.0	40 34	54	52	54
696	R. W. Hobbs & Sons	Rose 88rd	Shorthorn	Ab sent					63 4	1 13 1/2	28.01	Pale	Fair	29.25	40	29.85	.....	10 71.1	5 38	52	52	54
700	Lord Lucas	Primrose Gift	Shorthorn		Mar. 29 '08	June 20	9		69 4	8 7	33.01	Good	Good	35.00	N1	35.00	First Prize	10 71.1	5 38	52	52	54
702	R. L. Mond	Johnny Rose 10th	Shorthorn		Dec. 15 '07	May 14	46		63 4	8 7	33.01	Good	Good	35.00	N1	35.00	H. C.	10 71.1	5 38	52	52	54
703	G. E. Nelson & Sons	Pondy Straw Berry	Shorthorn		July 20 '09	June 25	14		69 4	8 7	33.01	Good	Good	35.00	N1	35.00	H. C.	10 71.1	5 38	52	52	54
707	H. H. Owtman	Newland Poughth	Shorthorn		May 8 '07	June 24	6		69 4	8 7	33.01	Fair	Fair	35.00	N1	35.00	.....	10 71.1	5 38	52	52	54
708	H. H. Owtman	Wallflower 9th	Shorthorn		Aug. 2 '09	June 16	11		65 10	3 13 1/2	28.53	Fair	Good	35.00	N1	35.00	.....	10 71.1	5 38	52	52	54
709	Major Pilkington	Aughton Sanctus	Shorthorn		Oct. 6 '10	April 6	81		65 10	3 13 1/2	28.53	Fair	Fair	35.00	N1	35.00	.....	10 71.1	5 38	52	52	54
710	Major W. N.	Dinah 7th	Shorthorn		May 21 '08	May 7	53		46 14	1 4 1/2	36.98	Fair	Fair	35.00	1.30	21.80	.....	10 56.11	19 20	53	52	53
714	Sir J. O. Thursby, Bt.	Rean Butterfly	Shorthorn		Jan. 25 '10	May 25	35		51 0	1 13 1/2	29.11	Very Fair	Good	31.25	N1	31.25	.....	11 01.1	35 35	53	53	53
715	Sir J. O. Thursby, Bt.	Roebuck 9th	Shorthorn		Sept. 29 '09	May 6	54		53 4	1 14 1/2	28.16	Good	Good	30.25	1.40	31.75	.....	11 01.1	35 35	53	52	53
717	Sir J. Timberlake	Heartsease	Shorthorn		Aug. 2 '08	June 12	17		44 19	1 21	24.92	Pale	Fair	18.50	N1	18.50	.....	11 12.11	58 46	53	52	53
718	Capt. A. S. Wills	Duchess of Oxford 8rd	Shorthorn		Oct. 24 '08	May 29	31		62 14	3 0 1/2	30.64	Pale	Good	48.25	N1	48.25	.....	11 16.11	43 29	53	52	54
719	Capt. E. Fife-Herbert Wright	Darlington 8th	Shorthorn		Jan. 14 '11	April 29	01		47 0	1 9 1/2	29.20	Fair	Fair	25.50	2.10	27.35	.....	12 40.1	30 50	52	53	54
727	Major W. N. Pilkington	Oxford Mistieive	Shorthorn		Dec. 27 '12	May 16	44		84 0	0 14 1/2	36.38	Pale	Fair	14.75	40	15.15	.....	11 30.12	20 50	53	52	52
731	The Lord Wandsworth Institution	Primrose 25th	Shorthorn		Oct. 5 '12	May 29	31		36 12	1 8	23.75	Good	Good	24.75	N1	24.75	.....	11 27.12	0 23	53	52	52
732	The Duke of Westminster	Rosemond Rose	Shorthorn		Mar. 20 '13	May 16	44		39 10	1 8	33.38	Very Fair	Good	19.00	40	19.46	.....	11 55.12	35 40	53	53	54
733	Capt. A. S. Wills	Peddington Lady	Shorthorn		July 2 '13	May 6	54		45 12	1 10 1/2	25.97	Pale	Good	26.75	1.40	28.15	H. C.	11 43.12	20 35	52	53	53
735	Capt. A. S. Wills	Victoria 2nd	Shorthorn		April 2 '13	May 6	54		56 8	1 3	27.33	Fair	Good	33.00	1.00	34.00	H. C.	12 7.12	30 23	52	52	52
739	Capt. A. S. Wills	Pas Power Buttery	Shorthorn		May 14 '13	Mar 23	101		23 0	0 15	39.13	Good	Good	15.00	5.00	20.00	.....	12 12.1	6 53	52	52	53
746	Major W. N. Pilkington	Duchess of Arma-Charles 1st	Shorthorn		Mar. 23 '14	May 21	39		28 0	1 8 1/2	24.93	Very Fair	Good	19.25	N1	19.25	.....	12 45.1	20 35	52	53	53
747	Major W. N. Pilkington	Green Wild Eyes	Shorthorn		Jan. 20 '13	June 17	13		24 10	1 0 1/2	23.87	Very Fair	Good	16.80	N1	16.80	.....	12 45.1	20 37	52	52	54
751	The Lord Wandsworth Institution	Sybil	Shorthorn	Ab sent													.....				

¹ The "Butter Ratio" represents the number of lb. of milk required to make 1 lb. of butter. Ten lb. of milk are reckoned as equal to an Imperial gallon.

TABLE III.—RESULTS OF BUTTER TESTS AT MANCHESTER, 1916—continued.

CLASS 218A—OPEN BUTTER TESTS. COWS EXCEEDING 900 LB. LIVE WEIGHT.

No. in Catalogue	Exhibitor	Name of cow	Breed	Live weight	Date of birth	Date of last calving	No. of days in milk	Date of service	Milk yield in 24 hours	Butter yield	Ratio	Colour and quality of butter		No. of pounds for period of incubation	Total No. of points	Awards	CHURNING TABLE						
												Colour	Quality				Begun	Finished	Durations	Dairy	Cream and churn	Buttermilk	
																							Time	No. of times
704	G. & J. Wilson & Sons	Proud Strawberry	Shorthorn	1243	July 30, '09	June 15, '16	4	—	103	10.2	18.40	Good	Good	5200	NIL	5500	10	510	40	57	52	52	54
705	John Evans	Burton Fox 6th	Irish Red	1244	Nov. 3, '09	April 16, '16	63	—	85	6	11.1	Good	Fair	2700	200	2010	10	510	41	52	52	52	54
706	John Evans	Burton Fox 6th	Irish Red	1245	Nov. 3, '09	April 16, '16	63	—	85	4	11.1	Good	Fair	2700	200	2010	10	510	41	52	52	52	54
707	J. H. Chick	Compton Quality	Devon	1246	Jan. 20, '09	May 14, '16	76	—	80	0	14.2	Good	Fair	1475	800	1835	10	510	50	52	52	52	54
708	J. H. Chick	Wyndford	Devon	1247	1908	April 1	89	June 9	40	8	1	27.00	Fair	2400	400	2800	10	10	48	38	52	52	54
709	Page & Whitley	Hilda 6th	S. Devon	1248	May 12, '06	June 15, '14	14	—	63	10	2	23.36	Excellent	3850	NIL	3850	10	42	11	33	52	52	54
710	Page & Whitley	Ruth 6th	S. Devon	1249	July 10, '06	June 15, '14	23	—	59	0	2	23.31	Good	3700	NIL	3700	10	42	11	33	52	52	54
711	Page & Whitley	Ruth 6th	S. Devon	1250	Nov. 12, '06	June 15, '14	23	—	59	0	2	23.31	Good	3700	NIL	3700	10	42	11	33	52	52	54
712	W. Gibson	Auchincloig	Arnhire	1251	Mar. 12, '10	June 9, '16	24	—	61	2	2	23.31	Fair	3400	NIL	3400	11	13	11	40	52	52	54
713	W. Gibson	Kato 2nd	Arnhire	1252	Mar. 12, '10	June 9, '16	24	—	61	2	2	23.31	Fair	3400	NIL	3400	11	13	11	40	52	52	54
714	R. Ford	Peak Flower	Holstein	1085	Feb. 25, '15	May 17, '16	43	—	54	8	1	28.35	Fair	3075	30	3105	11	13	11	46	52	52	54
715	Lady Wernher	Carlsbad	Holstein	985	Dec. 4, '07	Mar. 19, '16	108	May 29	37	8	3	17.14	Good	3500	600	4100	2	25	3	15	54	52	54
716	Lady Wernher	Carlsbad	Holstein	985	Dec. 4, '07	Mar. 19, '16	108	May 29	37	8	3	17.14	Good	3500	600	4100	2	25	3	15	54	52	54
717	A. W. Bailey-Hawkins	Stagshoe Rose of Guernsey	Guernsey	910	Nov. 20, '10	April 23, '16	83	—	40	4	1	21.28	Good	3025	200	3225	2	46	3	28	45	54	52

CLASS 218 B.—OPEN BUTTER TESTS. COWS NOT EXCEEDING 900 LB. LIVE WEIGHT.

1166	Grosvenor Berry	Nimrod's Dmsh	Jersey	819	July, 1908	Feb. 14, 1908	April 23	44	4	3	7	18.15	Good	2800	400	3200	12	412	55	51	52	52	54
1167	Mrs. Bradish	Lady Mayores	Jersey	861	Dec. 27, '12	Dec. 15, 1915	167	May 12	35	2	12	20.07	Good	2800	400	3200	12	412	55	51	52	52	54
1170	Miss Enderby	Handy May	Jersey	777	Dec. 8, '11	April 7, '16	83	June 1	40	10	1	28.80	Good	2425	400	2825	12	412	55	51	52	52	54
1171	W. H. Jackson	Pretty Victoria	Jersey	648	Nov. 6, '10	May 2, '16	58	—	35	14	1	29.48	Good	2875	150	3025	12	412	55	51	52	52	54
1172	A. Miller Ballet	Gooding	Jersey	700	April 8, '10	April 23, '16	66	—	42	6	1	28.35	Excellent	3075	200	3275	12	412	55	51	52	52	54
1173	A. Miller Ballet	Gooding	Jersey	700	April 8, '10	April 23, '16	66	—	42	6	1	28.35	Excellent	3075	200	3275	12	412	55	51	52	52	54
1174	A. Miller Ballet	Gooding	Jersey	700	April 8, '10	April 23, '16	66	—	42	6	1	28.35	Excellent	3075	200	3275	12	412	55	51	52	52	54
1175	A. Miller Ballet	Gooding	Jersey	728	Mar. 5, '09	Mar. 20, '16	101	April 20	35	4	1	29.22	Good	2775	610	3385	2	18	3	20	72	54	52
1176	A. Miller Ballet	Gooding	Jersey	835	Oct. 3, '09	April 23, '16	68	—	51	5	0	17.04	Excellent	2800	500	3300	2	18	3	20	72	54	52
1177	J. H. Smith-Barry	Nimrod's Dmsh	Jersey	875	April 26, '08	Feb. 8, 1915	8	May 20	28	12	1	17.09	Good	2800	800	3600	2	22	3	20	58	54	52
1180	J. H. Smith-Barry	Weekday's Daisy	Jersey	714	April 20, '10	June 8, '16	21	—	33	2	1	22.04	Good	2500	NIL	2500	2	22	3	20	58	54	52
1181	C. Williamson	Monday's Fox 4th	Jersey	740	Mar. 20, '11	May 24, '16	25	—	33	2	1	19.93	Fair	2500	NIL	2500	2	22	3	20	58	54	52
1182	Lady Wernher	Gooding	Jersey	805	April 8, '10	April 19, '16	71	—	19	4	1	17.43	Fair	1725	50	1775	2	22	3	18	51	54	52
1183	G. H. Smith-Barry	Gooding	Jersey	896	Mar. 12, '15	Feb. 8, 1917	147	April 14	30	10	1	17.04	Fair	2675	1970	3865	2	22	3	18	51	54	52
1184	Lake Shille	Gooding	Jersey	874	June 20, '09	April 19, '16	73	May 6	30	10	1	21.46	Excellent	2500	500	3000	2	22	3	18	51	54	52
1185	Mrs. J. M. Dorset	Gooding	Guernsey	736	Nov. 6, '06	May 14, '16	40	—	20	4	1	20.57	Good	2275	400	2675	2	22	3	18	51	54	52
1186	A. W. Bailey-Hawkins	Gooding	Guernsey	736	Nov. 6, '06	May 14, '16	40	—	20	4	1	20.57	Good	2275	400	2675	2	22	3	18	51	54	52

* The "Butter Ratio" represents the number of lb. of milk required to make 1 lb. of butter. Ten lb. of milk are reckoned as equal to an imperial gallon.

TABLE IV.—*Average Results of the Cattle in the Milk Yield Classes.*

No. of cows competing	Breed	Days in milk	Milk	Fat per cent.	Points
			Lb. oz.		
20	Shorthorn	44	50 9½	3·71	65·89
7	Lincolnshire Red Shorthorn . .	52	57 7½	3·34	72·02
8	Devon	67	37 10½	3·54	54·51
3	South Devon	20	61 7½	3·89	77·01
1	Longhorn	12	48 10	4·25	65·62
3	Red Poll	82	46 14	3·56	65·31
2	Ayrshire	23	55 9	4·03	71·71
4	Holstein Friesians	39	53 4½	3·57	67·56
14	Jersey	91	36 4½	4·72	60·29
8	Guernsey	74	36 3½	4·20	56·41
4	Kerry	37	34 4	3·77	49·35
3	Dexter	46	36 14½	4·07	53·79

III.—BUTTER TEST (CLASSES 215 & 216, A & B—CATTLE).

Through the generosity of the Dairy Shorthorn Association an extra class, limited, however, to Shorthorn cows and heifers entered in Classes 107, 108, and 109 was provided, in addition to the two classes for cows over and under 900 lb. live weight, open to all breeds, given by the English Jersey Cattle Society.

Notwithstanding that the number of entries was large, the actual cattle tested only reached 20 in the Shorthorn class, 12 in the open class for cows exceeding 900 lb. live weight, and 15 in the light weight division, or 47 in all.

The cattle in the two open classes were weighed on Tuesday evening, June 27, and all the cows were milked out on the following day.

The full particulars of the trials, with the prizes and awards given in each class, are given in Table III.

Table V. gives the average results of the various cattle tested under their respective breeds.

TABLE V.—*Average Results of the Cattle in the Butter Test Classes.*

No. of cows competing	Breed	Live weight	Days in milk	Milk	Butter	Ratio	Points
		Lb.		Lb. oz.	Lb. oz.	Lb.	
20	Shorthorn	—	40	46 8½	1 12½	25·77	28·90
2	Lincoln. Red do.	1347	54	54 2	2 2	25·47	35·40
2	Devon	1284	82	35 4	1 3½	29·10	23·57
3	South Devon	1507	20	61 7½	2 6½	25·48	38·58
1	Ayrshire	1218	24	61 2	2 2½	28·34	34·50
1	Holstein Friesian	1085	43	54 8	1 14½	28·35	31·05
14	Jersey	798	91	34 4½	1 13½	19·38	35·06
3	Guernsey	839	60	33 6	1 9½	21·07	27·33

TABLE VI.—MILK-YIELD CLASSES AT MANCHESTER, 1916.
CLASS 330.—MILK-YIELD CLASS FOR GOATS.

No. in Catalogue	Exhibitor	Name of goat	Breed	Date of birth	Date of last kid.	No. of days in milk	Milk yield in 24 hours	Per-centage of fat		Lbs. of fat	Points					Awards and Remarks
								Milk	Moist.		Milk	Pat. lbs. x 20	Solids-not-fat x 4	Lactation	Deduction	Total
1324	H. E. Hughes	Broxbourne March	Saanen	Mar. 26, '11	Mar. 16, '14	2 yrs.	3 14	2 40	2 90	10	35	270	1 40	6 00	2	11 27
1325	H. E. Hughes	Sedgemoore Grayer	Toggenburg	—	June 20, '14	2 yrs.	4 6	2 75	2 05	13	37	275	1 45	6 00	2	12 45
1326	Miss Joe Patourel	Wilmore Cornflower	Anglo-Swiss	Jan. 25, '10	Mar. 23	Absent	6 0	2 90	3 20	18	50	600	3 4	1 45	2	11 05
1327	Mrs. J. G. Straker	Halton Haibell	Swiss	Jan. 25, '12	Feb. 20	123	6 8	1 75	1 25	13	53	587	2 3	1 20	2	10 22
1328	Mrs. J. G. Straker	Halton Hechus	Swiss	Mar. 15, '12	Feb. 6	143	8 1	1 75	1 25	13	53	587	2 3	1 20	2	10 22
1329	Mrs. J. G. Straker	Buckley Berry	Anglo-Nubian	Jan. 2, '12	May 6	52	5 4	4 40	4 25	25	31	550	5 0	2 04	1	11 11
1330	Mrs. Reginald Pease	Sudbury Herford	Anglo-Nubian	Jan. 2, '12	May 6	52	5 4	4 40	4 25	25	31	550	5 0	2 04	1	11 11
1331	Mrs. Reginald Pease	Sudbury Herford	Anglo-Nubian	Feb. 26, '13	May 16	73	5 8	4 50	4 25	15	25	550	5 0	1 33	1	12 16
1332	Mrs. Reginald Pease	Sudbury Herford	Anglo-Nubian	Feb. 26, '13	Apr. 23	66	5 4	4 40	4 90	24	42	525	4 8	1 08	1	12 16
1333	Mrs. Reginald Pease	Sudbury Herford	Anglo-Nubian	Mar. 20, '09	June 16	11	3 14	5 10	5 40	22	40	387	4 2	1 00	1	9 87
1334	Mrs. Reginald Pease	Sudbury Herford	Anglo-Nubian	Mar. 20, '10	June 16	11	3 14	5 10	5 40	22	40	387	4 2	1 00	1	9 87
1335	Mrs. Reginald Pease	Sudbury Herford	Anglo-Nubian	Mar. 23, '13	Apr. 23	65	4 3	5 00	4 45	16	26	342	3 2	1 44	1	9 10
1336	Mrs. Reginald Pease	Sudbury Herford	Anglo-Nubian	Mar. 23, '14	Mar. 11	103	3 6	4 02	5 01	16	26	342	3 2	1 44	1	9 10
1337	Mrs. G. L. Pickard	Edenbrook Miranda	Anglo-Nubian	May 8, '14	June 11	16	9 8	4 70	4 75	42	87	950	8 4	3 48	1	21 38
1338	Mrs. C. L. Pickard	Forest Minkin	Anglo-Nubian	Apr. 10, '13	June 11	16	9 8	4 70	4 75	42	87	950	8 4	3 48	1	21 38
1339	Hon. Mrs. Pomeroy	Forest Noncinity	Anglo-Nubian	Apr. 10, '12	May 27	31	8 2	5 20	4 80	50	72	812	6 0	2 88	1	18 00
1340	Hon. Mrs. Pomeroy	Forest Noncinity	Anglo-Nubian	Feb. 24, '10	Mar. 15, '16	1 yr.	4 8	3 20	3 80	17	40	450	3 4	1 00	2	12 50
1341	H. E. Hughes	Broxbourne Fairy Queen	Toggenburg	Feb. 24, '10	Mar. 15, '16	1 yr.	4 8	3 20	3 80	17	40	450	3 4	1 00	2	12 50
1342	Madame Hunter & Soames	Pritchley Belle	Anglo-Nubian-Swiss	May 13, '13	Apr. 3	61	11 10	3 70	4 45	47	107	1182	9 4	4 28	1	24 65
1343	Mrs. Laoy-Hulbert	Withdeau Molly	Anglo-Swiss	May 13, '13	Mar. 6	118	8 8	3 00	3 10	37	76	850	5 4	2 04	1	16 15
1344	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1345	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1346	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1347	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1348	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1349	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1350	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1351	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1352	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1353	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1354	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1355	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1356	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1357	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1358	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1359	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1360	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1361	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1362	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1363	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1364	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1365	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1366	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1367	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1368	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1369	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26
1370	Mrs. C. L. Pickard	Pollenix	Anglo-Nubian	Apr. 13, '12	Mar. 6	118	4 2	4 00	4 70	17	38	412	3 4	1 44	1	10 26

To show the variations in the Butter Ratios during the past ten years the following table is inserted :—

TABLE VII.

Breeds	Six previous Shows Butter Ratio	Bristol Butter Ratio	Shrewsbury Butter Ratio	Nottingham Butter Ratio	Manchester Butter Ratio
	Lb.	Lb.	Lb.	Lb.	Lb.
Shorthorn .	32.15	32.91	30.64	27.95	25.77
Lincoln. Red					
Shorthorn .	29.02	30.47	29.07	23.39	25.47
Devon .	32.60	27.02	25.16	24.02	29.10
South Devon	31.37	25.66	29.43	26.54	25.48
Longhorn .	24.00	23.46	33.53	21.66	—
Red Poll .	36.84	—	36.56	30.41	—
Holstein .	—	35.15	—	27.19	28.35
Jersey .	20.57	21.01	21.07	18.80	19.38
Guernsey .	21.66	22.15	25.01	20.91	21.07
Dexter .	—	—	24.58	29.51	—

IV.—MILKING TRIALS (GOATS).‡

Twenty-two animals took part in this competition, the breeds represented being as follows :—Saanen, Toggenburg, Swiss, Anglo-Swiss, Anglo-Nubian, Anglo-Nubian-Swiss, Saanen-Nubian-Swiss. The goats were milked out on Wednesday, June 28, at 5 p.m., the milk of the following twenty-four hours being taken for the trials.

The prizes were awarded on the following scale of points :—

For each pound of milk 1 point.

For each 6 days the Goat had been in milk (deducting the first 40 days after kidding), with a maximum of 6 points $\frac{1}{6}$ of a point.

For each $\frac{1}{2}$ lb. of fat in the milk 5 points.

For each $\frac{1}{2}$ lb. of solids, other than fat, in the milk 1 point.

In cases where the milk contained less than 4 per cent. of fat 1 point was deducted.

The period of lactation to be calculated from the date of kidding to the first day of the Show.

Table VI. gives the full details of the trials and the names of the prize-winners.

At the request of some of the exhibitors of goats, the milk of the Anglo-Nubian and Swiss breeds was kept during one day in the week in separate churns and subsequently tested by the Gerber process for fat, with the following results :—

Breed	Fat per cent.	
	Morning	Evening
Anglo-Nubian	4.2	4.3
Swiss	2.45	1.70

EXPERIMENTS IN THE DAIRY.

To get at the amount of butter which is obtainable from the milks of the various dairy breeds of cattle in the Showyard an experiment similar to that carried out at Nottingham and

in preceding years was undertaken, two gallons of milk from the morning and evening meals respectively being used.

The weights of butter churned were in similar proportion to those which had been obtained before, and showed that, with the exception of the Channel Island and the Longhorn breeds, it is far more profitable to sell milk than to turn it into butter.

To show that the manufacture of cheese brings a better return than butter-making, where milk containing 3.0 to 3.5 per cent. fat is used, the following experiment was carried out:—

V.—CHEESE v. BUTTER.

Ten gallons of Shorthorn milk, after being thoroughly mixed, were divided into two equal lots of five gallons. The one was passed through a separator, the cream being subsequently churned, while the other was used for making a No. 1 Small Holders' Hard Cheese (Board of Agriculture Leaflet No. 231). The butter produced weighed 1 lb. 14½ oz., while the cheese reached 6 lb. 14½ oz. From this weight, however, an allowance of 12½ per cent. should be made for shrinkage, as the cheese would not be ready for consumption for three weeks or thereabouts. This allowance would reduce the weight of the marketable cheese to (say) 6 lb.

Taking the value of the whole milk at 10d. per gallon, the separated milk at 2d. per gallon, butter at 1s. 6d., and cheese at 1s. per pound, the following difference in value will be apparent:—

	s.	d.	s.	d.
5 gall. milk valued at 4s. 2d. produced cheese				
valued at			6	0
5 gall. milk valued at 4s. 2d. produced butter				
valued at	2	10½		
plus 5 gall. separated milk	0	10		
			3	8½
showing an extra profit on making cheese of			2	3½
on 5 gall. of milk, or about 5½d. per gallon.				

VI.—SMALL HARD CHEESES.

As the demand for hard cheese at the present time is large, and is likely to continue for some considerable time, small cheeses weighing from 1 lb. to 6 lb. were made in the Dairy to show—

- (1) The comparatively small quantity of milk that can be made into cheese.
- (2) The few and inexpensive utensils necessary.
- (3) The simplicity of the process.

The particular cheeses made at Manchester were as follows:—

No. 1 and 2 Small Holders' (Hard) Cheese (Board of Agriculture Leaflet No. 231).

Kingston Cheese. (Source of origin, the Midland Dairy College at Kingston, near Derby.)

Hutton, Wensleydales and Small Lancashires. (Source of origin, the Lancashire County Council Dairy School, Hutton, near Preston.)

Sample cheeses of all these varieties, which had been made some three weeks previously, were exhibited in the Dairy close to the vats where the cheeses were being made.

The selling price in each case varies with the age and quality of the cheese, ranging from 1s. 1d. to 1s. 6d. per pound. All these cheeses should be ready to sell in from three to four weeks after being made.

VII.—GOATS' MILK (HARD) CHEESE.

A hard pressed cheese of the No. 1 small holders' type was made from goats' milk.

Four gallons of milk were used, and produced 7 lb. of cheese, which, after allowing for shrinkage, should weigh about 6 lb. 2 oz. The cheese promised to be a very good one, but as it could not be sampled for from three to four weeks no report on its condition can be inserted here.

VIII.—COULOMMIER CHEESE.

Cheeses of this description were made throughout the week both from cows' and goats' milk. The latter were rather strong in flavour.

This variety of soft cheese requires few utensils, is easily made, and sells readily at a price which should return to the farmer from 1s. 3d. to 1s. 6d. per gallon for the milk.

IX.—WENSLEYDALE CHEESE.

An experiment similar to that carried out at Nottingham with Caerphilly cheeses was undertaken in the Dairy at Manchester, the type of cheese being Wensleydale, and the milks used being Shorthorn, Jersey and Guernsey.

The object of the experiment was to ascertain the differences, if any, in the weight and quality of the cheeses made from milks showing different percentages of fat, for which reason the three breeds named above were selected.

Thirteen gallons of milk were used in each case, the weight of curd being taken when the cheeses were bandaged, and after a period of fifteen weeks, when the cheeses were considered ripe.

The following table gives the full particulars of the experiment, from which it will be seen that the Jersey

milks being the richer in fat yielded a greater weight of cheese than the Shorthorn and the Guernsey.

TABLE VIII.

No.	Breed	Milk	Weight of curd when bandaged	Weight of curd when ripe	Loss in weight	Acidity
		Gall.	Lb. oz	Lb. oz	Lb oz	
1	Shorthorn . . .	13	17 12	11 8	6 4	·35
2	Jersey . . .	13	20 0	14 0	6 0	·55
3	Jersey . . .	13	20 0	14 12	5 4	·50
4	Guernsey . . .	13	14 8	11 12	2 12	6

The small weight of curd obtained from the Guernsey milk might be considered as abnormal, but for the fact that in a similar experiment carried out at the Show at Gloucester in 1909 the same discrepancy was noticeable.

The No. 2 cheese was a repeat experiment as the weather when No. 3 was made was thundery, and it was considered better to make a second cheese.

REMARKS.

1. Blue moulded slightly when ripe ; good quality.
2. Showing blue mould ; an excellent cheese.
3. Showing blue mould. The curd had, however, a strong unpleasant smell owing to thundery weather. The cheese eventually turned out better in quality than was expected.
4. Not blue moulded when tried, but of excellent quality.

X.—CHEESE MIXTURE.

To show how easily a hard cheese may be used up, small jars of this mixture were made up in the dairy, the only implements used being a mincing machine, an ordinary earthenware basin, and a spoon.

The process was watched by a crowd of visitors, and as proof that a real interest was taken in this and the manufacture of cream cheeses, over 1,000 of the Society's "Recipes for making cream and other soft cheeses" were sold in the dairy during the five days of the show.

XI.—SCALDED CREAM.

Continuing the work that was done in the dairy at Nottingham with scalded cream, the following experiments were undertaken :—

1½ gallons of both morning and evening milk were procured from 11 out of the 12 dairy breeds of cattle in the Showground, and were set in the cream pans for from 6 to 8 hours in the case of the morning milks, and from 16 to 18 hours in that of the evening. They were then scalded, the scalding temperature being noted in each case, as also the length of time taken in scalding and subsequent standing

before being skimmed, while to complete the record, the weight and quality of the skimmed cream, and the fat left in the skimmed milk were also put down, the latter being ascertained by the Gerber process.

As was expected the milks which had been set for 6 to 8 hours did not yield as well as those which had stood for 16 to 18 hours, the weights of the skimmed cream between the two lots varying from 20 to 50 per cent

Table IX. gives the quality and weight of creams obtained from several experiments, the times and temperatures shown being an indication of the figures recommended for each particular breed.

TABLE IX.

Breed	Weight of milk	Time setting before scalding	Temperature at which to scald	Time scalding	Time left before skimming	Weight of skimmed cream	Fat on skimmed milk	Quality
	Lb	Hours	Fahr	Minutes	Hours	Lb oz	Per cent	
Shorthorn .	15	16	185	40	2½	1 6½	8	Excellent.
Lincoln. Red do	15	18	188	38	24	1 1½	6	Very good
Devon .	15	18	185	25	24	0 1½	7	Good
South Devon .	15	16	190	40	22	1 1	4	Excellent.
Red Poll .	15	18	180	35	24	0 15	6	Good.
Ayrshire .	15	18	175	25	24	1 5	4	Excellent.
Holstein Friesian	15	17	190	40	24	1 2½	8	Very good
Jersey .	15	16	195	55	20	1 6	5	Excellent
Guernsey .	15	16	195	50	20	1 5	4	Excellent
Kerry .	15	18	175	25	24	1 2½	5	Very good
Dexter .	15	18	175	30	24	1 2	65	Fair

No notice has been taken of the colour of the scalded creams in the remarks as to quality, as that varies with the breed of the cattle.

In two cases, other than those in the table, the scalded milks were left to stand before skimming for 37 hours. In both cases no more cream was obtained; but more fat was found in the skimmed milk than in the skimmed milks of those which had only stood 24 hours, showing that nothing is gained by leaving the milks to stand after scalding longer than the 24 hours recommended.

I would express my sincere thanks to Mr. H. S. Gordon, my Assistant Steward; to Messrs. Hammond and Craufurd, the Secretaries of the English Jersey Cattle Society, for their great help in the milking and butter test trials; to Mr. R. W. Hasted; and to Miss Kirke and all the dairy assistants who carried out the various experiments in the dairy most conscientiously.

ERNEST MATHEWS.

Little Shardloes,
Amersham, Bucks

REPORT OF THE COUNCIL TO THE ANNUAL GENERAL MEETING OF GOVERNORS AND MEMBERS OF THE SOCIETY,

HELD AT THE ROYAL AGRICULTURAL HALL, ISLINGTON, N.
On WEDNESDAY, December 6, 1916, at 2.30 p.m.

Membership.

The Council have to report that the list of Governors and Members has undergone the following changes during the year which has elapsed since the Annual General Meeting on December 8th, 1915: 13 new Governors (including 2 transferred from the list of Members under By-law 7), and 777 new Members have joined the Society, and 6 Members have been reinstated under By-law 14; whilst the deaths of 3 Life Governors, 4 Governors, 1 Honorary Member, 99 Life Members, and 189 Members have been reported. A total of 26 Members have been struck off the books under By-law 12, owing to absence of addresses; 106 Members under By-law 13, for arrears of subscription; and 1 Governor and 214 Annual Members have resigned.

Deaths of Members of Council.

2. Since the last Annual Meeting the losses by deaths include the following who were Members of Council:—The Hon. J. R. de O. Boscawen, Mr. Richard G. Carden, Mr. John Henry Hine, and Mr. T. H. Miller.

Mr. Boscawen, who represented Cornwall, had only been elected to the Council a little over a year ago. For a considerable time he had been closely identified with the Society's Show, first of all in the dairy, and later as steward of the horticultural exhibition. The success of the latter was in a large measure due to his efforts.

Mr. R. G. Carden had represented Ireland, and Mr. John Henry Hine the County of Devon, on the Council since 1905.

Mr. Miller had first become associated with the Society as a Member in the year 1870, and joined the Council in 1884. He had acted as Steward at the Annual Shows held in the late 'eighties, and was Senior Steward on the occasion of the Windsor Meeting in 1889. He had been a regular attendant at the meetings of Committees and Council for several years, and had taken practical interest in agriculture generally, more particularly in his own county of Lancashire.

Deaths of Governors and Members.

3. Amongst other Governors and Members whose loss the Society has to deplore are:—The Marquis of Abergavenny, K.G., the Marquis de Vogue (H.M.), the Earl of Essex (G.), Earl St. Aldwyn, Viscount Ridley (L.G.), Lord Burnham, Admiral of the

Fleet Lord John Hay, G.C.B., Lord Redesdale (L.G.), Lord Scarsdale, Lord Thurlow, Lady Thursby, Admral the Hon. T. S. Brand (G.), Sir Reginald Cathcart, Bart., Sir Arthur P. Heywood, Bart., Sir Thos. Jackson, Bart., Sir Thomas Lees, Bart., Sir H. D. Le Marchant, Bart., Sir A. B. Markham, Bart., Sir R. Biddulph Martin, Bart., Major Sir H. P. St. J. Mildmay, Bart., Sir Algeron Peyton, Bart., Sir James Talbot Power, Bart., Field-Marshal Sir C. Brownlow, G.C.B., Sir E. Stafford Howard, K.C.B., Mr. Stephen Aveling, Col. E. H. Baldock, C.B., Mr. Fredk. Barlow, Col. N. Barnardiston, Mr. W. J. Birkbeck, Capt. J. S. Black, Mr. E. C. Blackstone, Mr. George Bolam, Lieut.-Col. W. H. G. Burke, Mr. R. B. Burrows, Mr. George Carrington, General Edward Clive, Col. H. E. Davidson, Prof. A. C. Dixon, M.A., Mr. W. Dutton, Major J. H. Ewart, Mr. T. F. Filgate, Col. E. A. Fitz-Roy, Mr. H. H. France-Hayhurst, Dr. J. K. Goodall, Lieut.-Col. G. Gosling, Mr. Edward Green (The Moors), Mr. Charles Hartley, Col. A. C. Cantrell Hubbersty, Mr. Thomas M. Hudson (1849) Mr. Tom Irving, Col. T. E. Jobling, Mr. J. Blandy Jenkins, Mr. F. D. Lambert, Mons. E. L. J. Lavalard (Paris), Mr. A. E. Manley, Mr. John Marshall, Mr. T. S. Minton, Mr. Thomas Olver, Mr. W. H. Pemberton-Barnes, Col. W. F. Pilter, C.B., Mr. J. McClymont Reid (G.), Mr. T. F. Ringer, Mr. Stephen Robinson (Lynhales), Col. G. W. C. Rothe, Mr. James Sinclair, Major C. D. Sherston, Mr. Patrick Taafe, Captain R. H. Verschoyle, and Mr. Sam Whitbread (G).

The deaths of the following Members of the Society have occurred whilst on active service:—Captain J. W. Backhouse, Mr. Michael G. Lloyd Baker, Major the Hon. G. V. Baring, Mr. Frank Beck, M.V.O., Capt. J. C. Bengough, Capt. Jersey de Knoop, Captain W. D. Drury-Lowe, the Earl of Feversham, Captain Sir R. M. Filmer, Bart., Mr. R. J. B. Frank, Second Lieut. A. E. Hamlyn, Mr. Edward Holland, Mr. Geoffrey P. Hornby, Mr. A. P. Humphry, Lieut.-Col. Edgar A. Innes, Mr. A. L. Kennaway, Col. J. H. Knight, the Hon. Gerald Legge, Lord Llangattock, the Earl of Longford, Mr. Sidney McDougall, Mr. Hugh J. Middleton, Mr. H. C. Pickering, Viscount Quenington, M.P., the Hon. P. S. St. Aubyn, and Lieut. E. F. H. Taylor.

Number of Governors and Members on Register.

4. The above, and other changes, bring the total number of Governors and Members now on the Register to 10,278, divided as follows:—

- 187 Annual Governors;
- 84 Life Governors;
- 7,534 Annual Members;
- 2,446 Life Members;
- 27 Honorary Members;

10,278. Total number of Governors and Members, as against a total of 10,144 Members on the Register at the time of the last Annual Report.

Changes in Council.

5. To fill the vacancies on the Council which have occurred during the year Mr. Brooking Trant has been elected as the representative on the Council for the Division of Cornwall; Sir John Thursby, Bart., as representative for the Division of Lancashire; the Right Hon. Frederick Wrench for the Division of Ireland; and for the Divisions of Lancashire and Cheshire, which are now each entitled to an additional Member of Council, Mr. W. Fitzherbert-Brockholes has been elected for Lancashire, and Captain W. H. France-Hayhurst for Cheshire.

Annual Election of Council.

6. Under the scheme of rotation settled in 1906, the Members of Council who retire at the Annual Meeting in December next are those representing the following electoral districts comprising Group "B":—Durham, Yorks. West Riding (two representatives), Nottingham, Leicester, Rutland, Suffolk, Buckingham, Essex, London (three representatives), Shropshire (two representatives), Hereford, South Wales, Devon, Wiltshire and Surrey. The Members of the Society resident in those districts have all been communicated with, and the necessary measures have been taken for the election or re-election of representatives for the divisions concerned.

Accounts.

7. In accordance with the By-laws, the balance-sheet has to be presented for consideration at the Annual General Meeting. The Council therefore beg to submit the balance-sheet for the year 1915, with the Statement of Ordinary Income and Expenditure. These accounts were published in Volume 76 of the Journal issued to Members early this year, having been duly examined and certified as correct by the Auditors appointed by the Members, and by the professional Accountants employed by the Society.

Agricultural Relief of Allies.

8. The Fund initiated by the Society for the assistance of our distressed Allies in the devastated areas of the War is progressing, and a sum of upwards of £100,000 has been promised or received.

The Council arranged for a series of auction sales in the Manchester Showyard of live stock, implements, poultry, produce, etc., in aid of the Fund, and as a result the sum of nearly £3,000 was realised. The Council desire to record their thanks to all those who kindly contributed gifts and to those who assisted in carrying out the arrangements in connection with the sales, etc.

The Duke of Portland (President of the Fund), the Earl of Northbrook (Chairman of the Executive Committee), and Mr. Charles Adeane (Honorary Treasurer) were present during the week, and the Hon. Assistant Secretary, Mr. F. F. Euren, was indefatigable in his efforts to secure the recognition of the public.

Manchester Show.

9. For the third time the Show of the Society has been held at Manchester, and as on each previous occasion has been of an exceptional character.

In 1869 the Prince of Wales, as President, attended the Show, accompanied by the Princess of Wales, and in 1897 the Duke of York was present as President of the Society. In the year 1897 the Diamond Jubilee of the late Queen Victoria was celebrated throughout the country. This year, in consequence of the War, the Society was not honoured with a Royal visit, but the President, the Duke of Richmond and Gordon, was present on each day of the Show. Never before has the Annual Show of the Society been held under such trying conditions, but nevertheless the Manchester people again scored a signal success, as, notwithstanding the modifications imposed by the Ministry of Munitions in the implement section, the total attendance was 149,197, and the excess of receipts over expenditure amounted to £4,481.

The principal restrictions were that no machinery was to be exhibited in motion—milking machines excepted—and that all the exhibits in this section were to have been actually manufactured by the 6th April, 1916. Many of the firms who regularly exhibit were unable to do so on this occasion in consequence of the work they were required to carry out for the Ministry of Munitions.

Taken all round, the Show was an excellent and enjoyable one and will long be remembered by the large number of visitors who took the greatest interest in the exhibits of live stock, machinery and implements and the many other sections of the Show. The judges of implements reported that large numbers of agriculturists visited the implement section and evinced the greatest interest in the exhibits of labour-saving machinery.

The Manchester Corporation and the Local Committee left nothing undone to ensure the success of the meeting and the Lord Mayor (Alderman Smethurst), with his predecessors, the late Alderman Copeland, the late Sir Walter Royce, Alderman Sir Daniel McCabe, Alderman Sir Edward Holt, Bart., and the Hon. Secretaries, Mr. Thomas Hudson (Town Clerk) and Mr. J. Herbert Hall, and several other representatives afforded the greatest assistance in connection with the preparations for the Show.

The Honorary Director, Sir Gilbert Greenall, was greatly assisted in his arduous duties by the local Hon. Treasurer, Mr. George Norris Midwood, and others resident in the locality, and was thereby enabled to open the Show complete in all respects at the stated time in spite of the very many difficulties incident to the exceptional conditions prevailing in the country. The Manchester Show will long be remembered as the "Second War Show," and its great success would undoubtedly have been very much enhanced if the weather on the last two days of the Show had not been so stormy and unpropitious.

Farmers' Milk Competition.

10. The Farmers' Milk Competition was again held, open to farmers supplying milk daily from Lancashire and Cheshire to Manchester, Salford, or anywhere within a radius of four miles from the Manchester Town Hall. The milks from 59 herds were tested for the prizes and certificates offered by the Manchester Local Committee and the Royal Agricultural Society of England. The report of the Society's Steward of Dairying on this competition together with the Milk Yield Trials and Butter Tests carried out at the Manchester Show has been published. The thanks of the Society have been conveyed to Dr. Niven, of the Public Health Department of the Manchester Corporation, and to Professor Sheridan Delepine, of the University of Manchester, for their services in connection with the Competition.

Cardiff Show.

11. Arrangements have been made to hold the Cardiff Show from Tuesday, June 26th, to Saturday, June 30th, 1917. An influential Committee has been appointed of representatives of the County and City to raise the necessary funds for carrying out the local requirements.

Offers of Champion and other prizes have been received from the following Breed Societies:—Shire Horse Society, Suffolk Horse Society, Hunters' Improvement and National Light Horse Breeding Society, National Pony Society, Hackney Horse Society, Welsh Pony and Cob Society, Shetland Pony Society, Shorthorn Society, Dairy Shorthorn Association, Hereford Herd Book Society, Devon Cattle Breeders' Society, South Devon Herd Book Society, Longhorn Cattle Society, Sussex Herd Book Society, Welsh Black Cattle Society, Red Poll Cattle Society, Aberdeen Angus Cattle Society, English Aberdeen Angus Cattle Association, Galloway Cattle Society, British Holstein-Friesian Cattle Society, English Jersey Cattle Society, English Guernsey Cattle Society, Shropshire Sheep Breeders' Association, Southdown Sheep Society, Hampshire Down Sheep Breeders' Association, Ryland Flock Book Society, Kerry Hill (Wales) Flock Book Society, Lincoln Long Wool Sheep Breeders' Association, Kent or Romney Marsh Sheep Breeders' Association, Cotswold Sheep Society, Breeders of Cheviot Sheep, Breeders of Herdwick Sheep, National Pig Breeders' Association, British Berkshire Society, Lincolnshire Ourlly Coated Pig Breeders' Association, Gloucestershire Old Spots Pig Society.

The following Challenge Cups are again also offered:—

£50 Silver Cup for the best Suffolk Stallion.

Fifty Guinea Cup for the best Riding Hunter.

Fifty Guinea Cup for the best Hack or Riding Pony.

Fifty Guinea Cup for best Single Harness Horse.

Fifty Guinea Cup for the best Tandem.

Fifty Guinea Cup for the best Group of Dairy Shorthorns.

Fifty Guinea Cup for the five best Animals by the same Sire in the Dairy Shorthorn Classes.

£20 Silver Cup for the best Animal in the South Devon Cattle Classes.

£15 Silver Cup for the best Longhorn Bull or Cow.

£15 Silver Cup for the best Longhorn Yearling Bull or Heifer.

Twenty-five Guinea Silver Cup for the best Animal in the Kerry Classes

£20 Trophy for the best Kerry Bull whose Dam has won a Prize in a Milk or Butter Test.

Twenty-five Guinea Silver Cup for the best Animal in the Dexter Classes.

Sixty Guinea Silver Cup for the best Border Leicester Ram or Ewe.

Twenty Guinea Cup for the best Large Black Sow.

£20 Silver Cup for best Berkshire Pigs.

13. The Council have to record the generous gift to the Society's Library by the Hon. Charles Rothschild, of Ashton Wold, Oundle, of a complete set of "Milk Record Books" of the late herd of Pedigree Dairy Shorthorns at Tring Park since the commencement, also a complete set of Private Herd Books of the same herd, which make a very useful addition to the Society's Library.

Chemical.

14. It could hardly be otherwise than that, with the continuance of the War, and the consequent increased difficulties of obtaining supplies of fertilisers and feeding stuffs, there would be a recorded diminution in the extent to which the analytical privileges of Members were utilised in the year under review. The number of samples sent for analysis was 250 as against 300 in 1915 and 436 in 1914. Prices of most articles—whether for manurial or for feeding use—have undergone an extraordinary rise, in consequence of shortness of labour and difficulties of shipping and transport. Manure manufactories have in many cases been given over to the production of oil of vitriol, and it has been hard to procure even an ordinary article like superphosphate. Potash salts are still practically unprocureable, no satisfactory substitute having been found for them. There would seem, however, to be a possibility of the newly discovered sources of potash salts in the North of Spain becoming available, and it is greatly to be hoped, in national interests, that efforts will be made to develop this source of supply. Sulphate of ammonia, of home-production, has been the one readily available nitrogenous material. Representations were made in the course of the year by the Council of this Society to the Board of Agriculture as to the desirability of not permitting the export of sulphate of ammonia until the requirements of the agriculturists were provided for, and it is satisfactory to record that concessions in favour of agriculture were made. Linseed cake has reached the extreme price of £15 per ton and cotton cake that of £10 10s. per ton, most other feeding stuffs undergoing proportionate rise. Among more recently introduced feeding stuffs, palmnut and coconut cake and meal chiefly have come into more general use; earthenut (ground nut) cake also is more met with

than before. It may, however, be said generally as regards the work of the Society's Laboratory, that farmers have had such difficulty in getting their wants supplied, that they have been only too ready to take anything, without troubling either about its cost or what its quality is, and this has shown itself in the lesser number of samples sent for analysis. At the same time such an occasion has, as shown in not a few cases brought to notice, proved the opportunity of the adulterator, and the need of continual control and vigilance by the exercise of the Society's analytical privileges has been abundantly proved. The adulteration of offals is a case in point. A change induced by the shortage of potash salts, and notified to Members by the issue of a separate leaflet, has been in the composition of soft soap as used for hop-washing purposes, soda now being necessarily used in place of potash. Correspondence has taken place between the Chemical Department and the Board of Agriculture in reference to trade practices adopted in the case of sale of linseed cake and of dissolved bones, compound manures, etc., with a view to getting a better understanding of the guarantees required under the Fertilisers and Feeding Stuffs Act. In addition to samples submitted by Members, 154 samples of milk (44 of these being goat's milk) and 25 samples of cider and perry were analysed in connection with the late Show at Manchester.

Woburn Experimental Farm.

15. The year has seen a further depletion of the staff at the Woburn Experimental Farm, and it is with great difficulty that the work—practical and scientific—has been carried on. Nevertheless, all the old series have been continued and some new experiments undertaken. Among the most important are the calf-rearing experiments, in which increased interest is being shown. The object of the last series undertaken was to see whether milk—either as whole milk or as separated milk—could be dispensed with in the rearing of calves. This was successfully demonstrated, it being found that after a fortnight's feeding of young calves on whole milk, foods such as palmnut meal, crushed oats, beans, etc., could be quite well used with water alone. In the Field experiments the value of wild white clover was further demonstrated, and also the beneficial influence of magnesia (within limits) on wheat.

The season generally was an unfavourable and trying one, though an excellent one for the hay crop. Wheat suffered considerably, but barley was a better crop, the root and potato crops being also much better than expected. At the Pot Culture Station investigations were carried on as to the utility of radioactive ores, of insoluble materials containing potash, and of bacterised peat ("Humogen"). In consequence of the absence of any railway facilities, the annual visit of Members to the Experimental Farm had again to be postponed, but the Farm Committee paid several visits, and, on July 26th, 19 Members of the Council and friends, among whom were the present and past Presidents of the Board of Agriculture—the Earl of Crawford and the Earl of Selborne—made an inspection of the Farm and the experiments in progress.

Botanical Department

16. From the numerical standpoint the enquiries received in the Botanical Department have been slightly in excess of those of the previous year, but, on the whole, they have been of a very similar nature. More enquiries have been prompted by the unusual prevalence of disease amongst the cereals, more especially in the wheat crop, and by the unavoidable spreading of the weed flora, owing to inadequate supplies of labour. Unfortunately no methods are known for the cure of the majority of these cereal diseases, and it has only been possible to recommend measures for preventing their appearance in the coming year. The enquiries with regard to weeds have been unusually interesting. They include a couple of plants which have probably escaped from gardens and become thoroughly established on arable land. Fuller details will be provided in the annual report which is now in preparation.

Zoological Department.

17. The summer of 1916 has been remarkable for the severity of attacks of injurious insects. There were early indications that such would be the case, for the eggs of some of the well-known pests were unusually abundant on various plants. Common insects, such as the lackey moth and cabbage caterpillars, have seldom been so numerous, and some pests of very rare occurrence, like the strawberry moth and the pygmy mangold beetle have reappeared. The Zoological Department has been fully occupied in giving advice with regard to treatment and in investigating obscure points in connection with the pests complained of.

Veterinary Department.

18. Since the beginning of the year no case of foot-and-mouth disease has been detected in Great Britain. There has been a slight decline in the number of confirmed outbreaks of anthrax, and the reported outbreaks of glanders have been lower than in any year since the disease was first scheduled with the exception of 1915. The outbreaks of sheep scab have been slightly in excess of those reported last year. Unfortunately, the outbreaks of swine fever have been more numerous than in any year since 1896. The number of swine slaughtered as diseased or exposed to infection, however, shows a very marked reduction, as compared with previous years, this being due apparently to the substitution of serum treatment for compulsory slaughter in dealing with the outbreaks.

Medals for Cattle Pathology.

19. As the result of the competitive examination at the Royal Veterinary College for the Society's Medals for proficiency in Cattle Pathology, including the diseases of Cattle, Sheep, and Pigs, the Silver Medal has been awarded to Mr. S. C. J. Bennett, of 61, Jesus Lane, Cambridge, and the Bronze Medal to Mr. D. A. Gillmor, of Dromahair, co. Leitrim.

"Queen Victoria Gifts."

20. The Trustees of the "Queen Victoria Gifts" Fund have made a grant of £140 for the year 1916 to the Royal Agricultural Benevolent Institution to be distributed as fourteen grants of £10 each to the five male candidates, five married couples, and four female candidates who polled the largest number of votes in their class, and who would not this year receive grants from any other fund in connection with the Royal Agricultural Benevolent Institution.

National Diplomas in Agriculture and Dairying.

21. The Seventeenth Annual Examination for the National Diploma in Agriculture was held at the Leeds University from the 20th to the 23rd March last, when ten candidates were successful in obtaining the Diploma. For list, see page 190.

22. The Twenty-first Examination for the National Diploma in Dairying was held this year for English students from September 16th to 22nd, at the University College and British Dairy Institute, Reading; and for the Scottish students from September 22nd to 27th, at the Dairy School for Scotland at Kilmarnock. Sixteen candidates were examined at the English Centre, of whom 11 were successful, and at the Scottish Centre 15 candidates were examined, of whom 10 passed. The names of the Diploma winners will be found on pages 193 and 194.

By order of the Council,

THOMAS McROW,

Secretary.

16, BEDFORD SQUARE,

LONDON, W.C.

8th November, 1916.

NATIONAL AGRICULTURAL EXAMINATION BOARD.

I.—REPORT ON THE RESULTS OF THE SEVENTEENTH EXAMINATION FOR THE NATIONAL DIPLOMA IN AGRICULTURE,

HELD AT LEEDS, MARCH 20 TO 23, 1916.

1. THE Seventeenth Examination for the NATIONAL DIPLOMA IN AGRICULTURE was, by the courtesy of the authorities, held at the University of Leeds from the 20th to the 23rd March last.

2. Originally the Examination was arranged to take place in the month of April as in former years. In order, however, that students who had enlisted under the Derby Scheme might have an opportunity to sit for the Examination before joining the Colours, it was found necessary at the end of January to alter the dates previously announced.

3. The subjects of Examination were Practical Agriculture (two papers), Farm and Estate Engineering (including (a) Surveying, (b) Farm Buildings, (c) Machinery and Implements), Agricultural Chemistry, Agricultural Botany, Agricultural Book-keeping, Agricultural Zoology, and Veterinary Science. Under the Regulations, the whole eight papers may be taken at one time, or a group of any three or four in one year and the remaining group of four or five in the year following. Candidates taking the whole Examination in one year who fail in not more than two subjects are allowed to take those subjects alone in the succeeding year. Candidates failing in a single subject of a group are permitted to take that subject again in conjunction with the second group.

4. Thirty-five candidates presented themselves, as compared with 101 last year. Two candidates took the whole Examination, 15 who had previously passed in certain subjects appeared for the second portion, and the remaining candidates came up for a group of subjects.

5. The following are the names of the 10 Diploma winners in alphabetical order :—

JAMES ALEXANDER BARBOUR, Harper-Adams Agricultural College,
Newport, Salop

HARRY B BESCOBY, Guestling, Hastings

ROBERT CAMPBELL BROADFOOT, West of Scotland Agricultural College,
Glasgow

JOHN DEMPSEY, Royal College of Science, Dublin.

HERBERT CALDWELL JAMES, Harris Institute, Preston.
 JOSEPH W. KIRKHAM, Midland Agricultural and Dairy College, Kingston, Derby.
 JOHN WILSON REID, West of Scotland Agricultural College, Glasgow.
 JOHN GEORGE RHYNEHART, Royal College of Science, Dublin.
 ARTHUR MUSGRAVE SMITH, Leeds University.
 NARAYAN R. K. R. ZANANE, Downing College, Cambridge.

No candidate on this occasion reached the honours standard.

6. Of the 18 candidates appearing for a first group of subjects, the 8 whose names are given below succeeded in passing, and are therefore entitled to take the remaining subjects at a subsequent examination, when, if successful, they will be awarded the diploma :—

ROBERT WILLIAM FAILL, Low Haswell, Haswell, Sunderland.
 JAMES FAIRWEATHER, Aberdeen and North of Scotland College of Agriculture, Aberdeen.
 DAVID GEORGE IRONSIDE, Aberdeen and North of Scotland College of Agriculture, Aberdeen.
 CHARLES A. J. KLOPPENBURG, Harper-Adams Agricultural College, Newport, Salop.
 WILLIAM MIDDLETON, Aberdeen and North of Scotland College of Agriculture, Aberdeen.
 MORGAN SHEEHY, Royal College of Science, Dublin.
 HERBERT WILLIAM TOMLINSON, Harper-Adams Agricultural College, Newport, Salop.
 FREDERICK WHITTLE, Harris Institute, Preston.

Six of the 10 unsuccessful candidates failed in a single subject, which, under the regulations, they will be entitled to take again next year in conjunction with the second group.¹

7. The Reports of the Examiners in the different subjects are appended :—

PRACTICAL AGRICULTURE. (First Paper, 300 Marks. Second Paper, 300 Marks.)
 Professor William Somerville, M.A., D.Sc., William Burkitt, B.Sc., and Edward Porter, B.Sc.

Considering the unusual circumstances of the examination, the results were fully up to expectations. The number of candidates who were manifestly unprepared was small, while quite a large percentage showed evidence of careful study and fairly intimate acquaintance with the details of practical agriculture.

FARM AND ESTATE ENGINEERING. (300 Marks.)

- (a) Surveying and (b) Farm Buildings, R. Strachan Gardiner, F.S.I.
- (c) Machinery and Implements, T. Wibberley, N.D.A., N.D.D.

Land Surveying and Farm Buildings.—With two or three exceptions, a fair general knowledge in theory was shown in these two sections. Some candidates were not

¹ To meet the cases of candidates who have passed a portion of the examination and who, in consequence of their having joined His Majesty's Forces, may be unable to present themselves for the remaining subjects, the Board have agreed to grant to such candidates an extension of one year in which to complete the examination. The Board will also be pleased to consider applications for any further extensions of time that may be found necessary.

clear as to the difference between laying down lines for a chain survey, and for computing areas. No one knew what a "shrunk" ordnance scale was, and why it is used on the lithographed sheets. I would again emphasise the necessity for acquiring a better knowledge of Ordnance Maps. In the *word* examination, it was evident that the majority of the candidates had very little practical experience of setting up and using a Theodolite and Dumpy Level. More time should be given to practical field work in Chain Surveying and Levelling.

Machinery and Implements.—In this section the standard of marks obtained was very low. Of the 17 candidates who presented themselves for examination, 10 failed to obtain the minimum pass marks required—50 per cent. In both the written and oral examinations, it was evident that whilst the candidates had devoted considerable attention to the theoretical side of Agricultural Engineering, little or no attention had been given to the practical side. This latter feature is one requiring the most serious consideration on the part of students and teachers of agriculture.

For years the farm and the factory have been in direct conflict for the labour supply, and the only way the farm can hope to compete with the factory on anything approaching an equitable basis is to adopt the factory method of using every labour-saving device of proved merit. Hence a thorough knowledge of farm machinery both from the theoretical and practical side is all important.

AGRICULTURAL CHEMISTRY. (300 Marks.) E. J. Russell, D. Sc., and Professor Edward Kinch, F.I.C., F.C.S.

The work done by the candidates was not quite up to the usual standard, but it was considerably better than might have been expected in view of the special circumstances of the time. There was some tendency to confusion of thought; such widely distinct things as *nitrification* and *nitrogen-fixation* were hopelessly mixed up, and definite terms like "denitrification" were frequently wrongly used. Perhaps the most notable defect, however, was the circumstance that few of the candidates knew anything about experiments made at colleges except their own—even experiments that are often referred to and frequently described. Agricultural Chemistry is not a subject in which there ought to be any narrowness of outlook, and it is hoped that teachers will encourage their students to take the wide view, and learn something about experiments made at other centres than their own.

AGRICULTURAL BOTANY. (300 Marks.) Professor R. H. Biffen, M.A., F.R.S.

The written papers were satisfactory, on the whole, but in the *word* examination very few of the candidates appeared to have a satisfactory acquaintance with the practical side of the subject. This was especially noticeable in the parts dealing with the diseases of plants and with the recognition of the more important varieties of cereals. In fact, hardly a single candidate could identify a typical sample of Archer's barley or such a well-known parasite as the fungus causing wart disease of potatoes.

AGRICULTURAL BOOK-KEEPING. (200 Marks.)

Alex. McCallum, M.A., LL.B.

On the whole, the papers were of average merit; two of them were excellent. The theory questions were poorly answered. There was a lack of appreciation of the reasons of certain operations. Mere statements of mnemonic rules are insufficient: some attempt to grasp the logical nature of the system is wanted. With a thorough knowledge of the theory, its application to problems of practice should be comparatively simple. Surprisingly few of the candidates appeared to be aware of the exact significance of recent Budget regulations in relation to the farmer's income.

AGRICULTURAL ZOOLOGY. (200 Marks.) John Rennie, D.Sc.

The majority of the candidates in Agricultural Zoology did very well and showed a ready familiarity with the life-histories and inter-relations of the most important insect and other animal pests. Generally, a clear knowledge of the economic status of a fairly wide range of types was found to exist, and the candidates appeared familiar with the usual preventive and remedial measures for insect attacks. There were, however, indications that this knowledge was of a theoretical or bookish character and it is desirable that candidates should have more first-hand acquaintance with treatment tests and be more familiar with the mode of action of the substances used.

The comment made by the Examiner last year regarding the lack of illustrative sketches in the written paper is still applicable, and the inferiority, in point of detail, of those submitted as compared with the drawings in the candidates' laboratory note books was, in almost every case, very marked.

VETERINARY SCIENCE. (200 Marks.) Professor Sir John McFadyean, M.B.

With a few exceptions, the candidates displayed a reasonable knowledge of the anatomy and physiology of farm animals.

8. The thanks of the Board are again due to the authorities of the University of Leeds, for their liberality and courtesy in placing the Large Hall and other rooms of the University at the Board's disposal for the Examination; and to the Examiners, for the care and attention they bestowed upon the written answers to the papers set, and upon the *vivâ voce* examination.

J. MARSHALL DUGDALE, *Chairman*.

THOMAS MCROW, *Secretary*.

16 Bedford Square, London, W.C.
April, 1916.

II.—REPORT ON THE RESULTS OF THE TWENTY-FIRST EXAMINATION FOR THE NATIONAL DIPLOMA IN DAIRYING, 1916.

1. The Twenty-first Annual Examination for the National Diploma in the Science and Practice of Dairying took place in September, 1916. The Examination was held for English candidates at the University College and British Dairy Institute, Reading, from September 16 to 22; and for Scottish candidates at the Dairy School for Scotland at Kilmarnock, from September 22 to 27.

2. Sixteen candidates presented themselves at the English Centre, and of these the following eleven satisfied the Examiners, and have, therefore, been awarded the National Diploma in the Science and Practice of Dairying :—

ETHEL BOOTH, Lancs. C.C. Dairy School, Hutton, Preston.

MARGARET HOWARD, Midland Agricultural and Dairy College, Kingston, Derby.

EDITH BLANCHE HUDSON, Lancs. C.C. Dairy School, Hutton, Preston.

JOSEPH WILLIAM KIRKHAM, Midland Agricultural and Dairy College, Kingston, Derby.

AGNES MURIEL BARROW MUSSON, Lancs. C.C. Dairy School, Hutton, Preston.

MARGARET PHILLIPS, University College of Wales, Aberystwyth.

DORIS POSTLETHWAITE, Lancs. C.C. Dairy School, Hutton, Preston.

WALTER RUSHTON, University College and British Dairy Institute, Reading.

MARY FORSHAW TAYLOR, Midland Agricultural and Dairy College, Kingston, Derby.

GERTRUDE MARY WEATHERALL, Midland Agricultural and Dairy College, Kingston, Derby.

MILDRED ROBERTS SPENSER WILKINSON, University College and British Dairy Institute, Reading.

3. At the Scottish Centre, fifteen candidates were examined, and of these ten whose names and addresses are given below gained the Diploma :—

LIZZIE BEVERIDGE, Fullwood Farm, Stewarton.
 CATHERINE CAMPBELL JACKSON, Arichonan, Lochgilphead.
 MARGARET ELIZABETH JENKINS, Llantwit Vardre Vicarage, Pontypool.
 MARY LOCHRIE, West Kirkland, Wigtown.
 ELIZABETH MOLLINS, Gibbonhill, Troqueer, Dumfries
 ANNIE PRICHARD, Cefn Caernan Uchag, Caerphilly.
 BESSIE ROBERTSON, Belerlain, Dunphail.
 ADELAIDE M. THOMSON, Redford, Laurencekirk.
 MARION WEIR, Westmains, Carnwath.
 MARY YOUNG, Pleasantfield, Ayr.

Mr. J. F. Blackshaw, who conducted at both centres the Examinations in General Dairying, in Practical Butter-making, and in capacity for imparting instruction, reports that "In the subject of General Dairying the candidates at the English and Scottish Centres showed about equal merit in regard to training and experience. The average standard of excellence was not high in either case, and, while there were a few candidates who displayed greater ability than the rest, there was no case of outstanding efficiency. In the paper work the ordinary questions were reasonably well answered, but the answers given to those questions which required rather more practical thought and a knowledge of the results of recent research and practical demonstration, were not so well done. A very noticeable defect was the imperfect knowledge and lack of practical experience of the working of milking machines. The majority of the candidates had neither worked nor cleaned a machine. This state of affairs ought not to have existed, and it is due, probably, to certain approved teaching institutions neglecting to provide, for practical teaching purposes in this branch of work, the necessary equipment.

"The knowledge of the candidates in regard to poultry keeping was for the most part satisfactory, with the exception of certain candidates at the English centre who acknowledged that they had received no instruction in this subject. These candidates were, thereby, placed in an unfair position, and it seems legitimate to express surprise that the institution, or institutions, responsible for their training should have sent them forward for examination without having completely covered, by suitable instruction, the syllabus of the examination.

"Practical Butter-making was well done by all the candidates at the Scottish centre, and by the majority of those at the English centre, but there were some in the latter case who exhibited a want of tidiness and smartness in working.

"In offering these observations an endeavour has been made to allow for certain disadvantages—such as the depletion

of teaching Staffs, etc., occasioned by the War—under which the candidates were trained.”

The Examiner in Cheese-making, Mr. John Benson, reports that “On the whole the results in the paper and *vivâ voce* examination were not so good as usual. This was probably due to the lack of facilities for obtaining information in the Agricultural and Dairy Colleges—so many of the male teachers and experts having joined the army. Knowing, however, the difficult circumstances in which these Colleges are placed, it was to be expected that the candidates would not be so well trained as in past years, but, speaking generally, the majority of candidates possessed a good and sound knowledge of the theory of Cheese-making.

“On the other hand, the practical side of the Examination in Cheese-making was, with few exceptions, most satisfactory, and better than at any other previous examination which I have conducted for the Board. There being fewer pupils at the Dairy Schools, and milk having been plentiful this year, the candidates had certainly had more opportunity of dealing with milk, and had evidently made good use of the facilities afforded.

“In the hard-pressed cheese section the work done was particularly good, some very fine cheeses being made both at Reading and Kilmarnock. The work, however, of a small minority of the candidates at the English Centre did not exactly please me. These few candidates did not follow in practice the best and simplest methods of attaining their objective. They did not attack their work in a good professional manner, being dilatory and a little amateurish and gave one the impression of having been badly trained. It is with the teaching that fault has to be found, and I would suggest to all Teachers at Dairy Schools the necessity of their practice being sound and business-like. They must not expect their pupils to do well in examinations if the training is not adequate or on correct lines.

“In conclusion, I would add that the milk provided for the examination this year was excellent, and in good condition, and that all the arrangements made were most satisfactory.”

Dr. Voelcker reports that “The work in Chemistry and Bacteriology was only moderately satisfactory. As a rule the papers were sufficiently good to carry candidates through, but the *vivâ voce* examination showed a great lack of sound acquaintance with the elementary facts of chemical science. Nor was the application of these to outside daily practice understood. This was, for instance, well illustrated by the fact that only two out of the sixteen candidates had any idea of the part

played by the products of coal distillation in the present manufacture of munitions. One paper only was exceptionally good, two others were decidedly good, while only one was decidedly bad, the remainder being just average. The more purely chemical questions were those worst answered, those dealing more with the practical working of the dairy being the best, the bacteriological questions also being, on the whole, well replied to.

"At the Scottish Centre the results of the Chemistry and Bacteriology part of the examination were much on the lines of those at Reading. Well written papers were succeeded by poor *vivâ voce* results, this latter part of the examination being distinctly unsatisfactory. The failure in this respect was more marked at Kilmarnock than at Reading, and never before have I experienced such a poor exhibition in the *vivâ voce* examination.

"While making certain allowances for difficulties in obtaining continual and systematic teaching under present conditions, it is yet hard to understand how candidates who, with but one exception, did very fair and even good papers, failed so lamentably in the *vivâ voce* examination. Whereas in the written part there was only one absolute failure, there were only two candidates who scored half marks or over in the *vivâ voce*. The failure was a general one, that of any clear or definite knowledge of the elementary principles of chemical science, and without this it is hard to imagine how anyone, though able perhaps to reply in writing to certain questions, can ever really understand the true bearings of science upon them, or be qualified to act as a teacher of others. This is exemplified by the fact that not above six of the fourteen candidates could give a clear explanation of such elementary chemical processes as oxidation, reduction and bleaching, or could distinguish between carbohydrates and hydrocarbons. When it came, further, to the explanation of the application of principles to such common manufacturing processes as the steaming of bones, or the distillation of coal, there were only two candidates out of the fourteen who knew anything about these. Similarly, in Bacteriology, there were only these two candidates who could give any adequate description of *symbiosis*.

"I am induced from the above to insist more than ever on the importance of a *vivâ voce* examination as a necessary supplement to a written paper, and to call attention to the need of careful instruction in elementary chemical principles as a requirement for the subsequent imparting of adequate instruction in dairying."

J. MARSHALL DUGDALE,
Chairman.

ANNUAL REPORT FOR 1916 OF THE PRINCIPAL OF THE ROYAL VETERINARY COLLEGE.

ANTHRAX.

THE following Table shows the number of outbreaks of this disease and the number of animals attacked during each of the last six years :—

Year		Outbreaks		Animals attacked
1911	...	907	...	1,120
1912	...	743	...	840
1913	...	594	...	652
1914	..	722	...	796
1915	...	575	...	642
1916	...	571	...	687

As will be seen from these figures, variations in the number of outbreaks of the disease have not been great during the last five years, but it is worthy of note that the number for the past year is the lowest for the period, and indeed the lowest since 1899.

When the number of animals susceptible to anthrax is taken into consideration, the number of outbreaks and of animals attacked is very small, and the total loss which the disease occasions is, from an economic point of view, almost negligible.

As has always been the case, the number of animals attacked during the past year has been only slightly in excess of the number of outbreaks. In other words, in the great majority of outbreaks the disease did not spread from the first animal attacked—a fact which is in complete contradiction with the popular view regarding the nature of the disease.

A remarkable fact in connection with the incidence of anthrax, and one that has been increasingly prominent during recent years, is the large proportion of outbreaks furnished by Scotland, as compared with England and Wales. Thus, during the year 1915 the total number of confirmed outbreaks of the disease in Great Britain was 575, and of these 281 were in England, 3 in Wales, and 291 in Scotland.

As the great majority of the cases occurred in cattle it is of interest to contrast these figures with the number of bovine animals in each of the three countries in the same year. These were: England, 5,280,947; Wales, 783,207; Scotland, 1,223,933.

It thus appears that in 1915 the outbreaks occurred in the proportion of one outbreak to 21,338 cattle in England and Wales, and one outbreak to 4,205 in Scotland. In proportion to the number of the animals which contribute most of the

victims, the disease was therefore about five times as prevalent in Scotland as in England and Wales.

The inequality is even more striking when one compares the number of outbreaks in different counties. Thus, in the whole of Yorkshire, with a cattle population of approximately 570,000, the outbreaks numbered 73, while in Aberdeen there were 77 outbreaks among 174,000 cattle, and in Banff 37 outbreaks among 45,000 cattle.

But the distribution of the outbreaks is very unequal in Scotland itself, for whereas the two counties last mentioned had together 114 outbreaks among 219,000 cattle, in the four neighbouring counties, Ayr, Dumfries, Kirkcudbright and Wigtown, there were only 40 outbreaks for a combined cattle population of slightly under 300,000.

As has been pointed out in previous annual reports, there are good reasons for supposing that the great majority of the outbreaks of anthrax in this country are exotic, and due to the introduction of the germs of the disease with imported feeding materials from abroad. It is probable that this is the correct explanation of the very unequal incidence of the disease throughout the country, the outbreaks being most frequent in counties where a large proportion of imported feeding stuffs is used. It also explains the fact that the measures which have now been enforced for many years in dealing with carcasses in order to prevent lasting contamination of premises or land do not appear to hold out any hope that the disease can be eradicated or even greatly reduced.

A case of anthrax which was investigated during the past year may here be mentioned as illustrating a very unusual source of infection. A cow which was suffering from an attack of inflammation of the udder was treated with a so-called "vaccin," the material being injected under the skin of the neck. About fourteen days afterwards a large swelling developed in the neck and extended down to the chest, and death occurred two days later. Microscopic examination of blood which was taken from the carcass showed that the cow had died from anthrax, and the swelling in the neck then raised the suspicion that infection had taken place at the time when the vaccin was injected into that region. An unopened tube of the same vaccin which remained in the veterinary surgeon's possession was afterwards sent for bacteriological examination, which proved that the vaccin contained living and fully virulent anthrax spores.

There appears to be little room to doubt that, through some accident in its preparation, the vaccin had been contaminated with anthrax culture. The only apparent difficulty in the way of accepting this explanation is the long period (fourteen

days) that elapsed between the injection of the vaccin and the development of the swelling in the neck, for as a rule the swelling which follows subcutaneous inoculation with anthrax bacilli or spores begins within two or three days. In this case, however, the long period of incubation may be explained by the small number of anthrax spores present in the vaccin, and by the fact that the material proper to the vaccin exercised a restraining influence on these spores when they were injected under the skin. That such an effect may be produced when an animal is inoculated with mixed cultures is a fact well known to bacteriologists.

GLANDERS.

The following Table shows the incidence of the disease during the last eight years :—

Year	Outbreaks	Animal attacked
1909	533	1,753
1910	351	1,014
1911	208	501
1912	173	314
1913	162	447
1914	97	286
1915	50	87
1916	47	117

It is regrettable but, having regard to the circumstances, not surprising that the rapid decline in the number of outbreaks which began with the introduction of the present Glanders Order in 1908 has not been continued during the past year. The success of the Order depends upon the fact that it indirectly compels the owner of a stud in which glanders has broken out to allow all the apparently healthy horses to be tested with mallein, and permits the local authority to slaughter the reacting animals and pay compensation to the owner. As permanent concealment of the existence of glanders in a stable is difficult, and also unprofitable for the owner, such a system of dealing with the disease was bound to bring about a rapid decline in the number of outbreaks, and eventually to exterminate it. Obviously, however, the latter result may be delayed by occasional failure of an owner to notify the existence of the disease, and by the sale of horses that are known or suspected to have been exposed to risk of infection.

These considerations would account for the fact that the last of the disease has not yet been seen in this country, but account has also to be taken of the fact that since the outbreak of war a considerable number of cases of glanders have been imported in horses purchased for the army. The majority of these cases have no doubt been detected by the mallein test on

arrival in this country, but probably some have escaped, with the result that outbreaks have occurred here and there among army horses in different parts of the country. Such outbreaks are not included in the above Table, but it is obvious that their occurrence involves a risk that the infection may extend to horses belonging to the civil population.

It is therefore not to be expected that glanders will be absolutely eradicated in the near future, and there is even a likelihood that there may be an appreciable increase in the prevalence of the disease during the next few years.

SHEEP SCAB.

The following Table shows the number of reported outbreaks during the last six years :—

Year	Outbreaks
1911	434
1912	302
1913	236
1914	226
1915	257
1916	427

The figures for the past years confirm the opinion expressed in last annual report, that if sheep scab is to be actually exterminated the existing regulations will have to be strengthened. As there has actually been a considerable increase in the number of outbreaks during the past year, it might be held that the measures now prescribed are insufficient even to hold the disease in check, but it ought to be remembered that the same measures reduced the annual outbreaks from 1,418 in 1904 to 226 in 1914. The increase during the past year has probably been caused by less stringent administration of the regulations owing to circumstances arising out of the war.

SWINE FEVER.

The following Table shows the number of confirmed outbreaks of this disease during the past seven years :—

Year	Outbreaks
1910	1,594
1911	2,466
1912	2,920
1913	2,573
1914	4,356
1915	3,994
1916	4,331

Although the outbreaks during the past year exceed those of any year since 1896 with the exception of 1914, the figures cannot be said to be disappointing, since there was no reason to expect that the method of dealing with the disease which has recently been adopted would prove to have any advantage

in preventing the spread of infection. The change which has been made by the Board of Agriculture and Fisheries in dealing with outbreaks amounts to an abandonment of the attempt to eradicate the disease by compulsory slaughter of all diseased and suspected pigs, and the encouragement of the use of serum as a means of diminishing the owner's losses.

In 1913 the adoption of what may be called the serum treatment was pressed upon the Board by various societies professing to represent the views of those specially interested in pig breeding and bacon curing, and it was also recommended as worthy of encouragement in the final report of the Departmental Committee which was issued in 1914. The same committee were of opinion that the attempt to exterminate the disease by general slaughter should be abandoned "for the present."

Although the Departmental Committee were under no illusion as to the inutility of serum as a means of preventing the spread of the infection and the production of fresh outbreaks, and advised that, for this purpose, reliance should continue to be placed on the isolation of infected premises and restrictions on movement from them, there is some reason to fear that some of those who quoted the examples of Holland, Hungary, and the United States in regard to the use of serum as worthy of imitation had not realised the disadvantages of serum treatment from the point of view of an owner.

There can be no doubt that the method of dealing with outbreaks which was in general most satisfactory to the owner was the one employed during the first few years after the disease was taken out of the hands of the local authorities and dealt with directly by the Board of Agriculture. During that period the practice was to "slaughter out" and pay liberal compensation to the owner. How expensive a method this was for the State may be gathered from the fact that in the six years 1894-1899 no fewer than 320,798 swine were slaughtered as diseased or suspected, or an average of thirteen for each outbreak. As late as 1912 the average number of animals slaughtered in each outbreak was nearly the same, but during the past year it has fallen to less than three (2.1). The new system will effect a great saving to the national exchequer, with, of course, the result that such loss as may be occasioned by death of pigs from the disease will fall upon the owner.

As the policy of slaughtering out, with compensation to the owner, has been abandoned by general consent, it is to be hoped that the new method of dealing with outbreaks will not lead to a further spread of the disease. Fortunately there is no reason to anticipate that it will as long as there is no relaxation of the restrictions on movement from premises known to

be infected, though the fact cannot be overlooked that the method of serum treatment which is now generally adopted involves a great increase in the number of pigs which contract the disease, and thus considerably increases the risk attaching to an outbreak, as compared with the time when all the pigs on the premises were promptly slaughtered. This happens because the injection of serum gives protection against the disease for only two or three weeks, and in order to obtain any advantage from its employment it is in general necessary to allow the injected pigs to contract the disease just at the time when the immunity is passing off. In such a case the resulting attack of swine fever is usually harmless, except in very young pigs, and after it has passed off the animal is left immune.

It is also to be hoped that the new system will not prove too disappointing to pig breeders and owners among whose stock the disease breaks out. It cannot be too strongly emphasised that the abandonment of slaughtering out, with compensation, will inevitably entail serious loss on owners unless they promptly take measures to protect themselves. In their own interests they must immediately notify the suspected existence of the disease, and when swine fever has been officially diagnosed they must—and again in their own interests—either themselves slaughter all the apparently healthy pigs whose carcasses can be marketed, or, having destroyed all the ailing animals, apply the serum treatment to the others. When the disease is diagnosed early, and the latter plan is adopted, the losses are seldom or never serious, except in the case of suckers or pigs recently weaned. On the other hand, now that there is no compensation, the disease will exact a severe penalty from the owner who fails to notify its existence promptly, or who puts off time in considering whether he will adopt the serum treatment or not.

JOHNE'S DISEASE.

The researches with regard to this disease which have recently been conducted at the Royal Veterinary College¹ have yielded some new and important information.

A report regarding the treatment of the disease was embodied in the Annual Report for 1914, and it need only be stated here that subsequent experience has shown that, while sulphate of iron in some cases has a remarkable effect in checking the course of the disease, it is doubtful whether in any case it effects a complete cure.

One animal in which the treatment appeared to be completely successful was the one described as Case 2 in the

¹ McFadyean, Shertheil, and Edwards. *Journal of Comparative Pathology and Therapeutics*, Vol. XXIX, Parts 1, 2, and 3

previous report, but when that animal was eventually slaughtered, in good condition, it was found that there was extensive disease of the intestine. It is in the highest degree probable that if this animal had been allowed to live it would have had a relapse, and in any case it certainly continued to be a dangerous animal, since at the time of death enormous numbers of the bacilli which are the cause of the disease were found to be present in the mucous membrane of the bowel.

In the present state of knowledge therefore the treatment of animals affected with Johne's disease can not be advised, except possibly in the case of cattle of quite special value, and then only provided the animals can be most strictly isolated while under treatment. The most economic plan of dealing with cases of the disease is to have them slaughtered as soon as their condition has been certainly diagnosed.

Recent investigations have disclosed the fact that the disease is by no means confined to cattle, but also occurs among sheep and goats, and one case has been detected in a horse. On one particular farm the disease was found to be the cause of serious loss in sheep, and the history obtained suggested that this had been going on for a considerable number of years. In this instance very few cattle were kept on the farm, and there was no history of any illness pointing to the occurrence of Johne's disease among these animals. The symptoms in the sheep were very similar to those observed in cattle, viz., more or less rapid loss of condition, accompanied generally by diarrhoea, although this last symptom does not appear to be so constant in sheep as in cattle. In some of the cases observed in goats there had been no diarrhoea, but the animal had eventually been reduced to a very emaciated condition.

The attempts which were made to infect cattle and sheep by inoculation or feeding brought out the fact that many individuals offer a high degree of resistance to infection. Thus, out of three young cattle which were given large doses of bacilli by the mouth, only one became infected. Two young cattle were inoculated subcutaneously, and in one of these the result was negative and in the other doubtful. In seventeen cases large doses of bacilli were inoculated into a vein, which, one would have supposed, must be a certain method of infection in an animal that is not actually immune, but when these animals were eventually killed at periods up to two years after the inoculation it was found that only eight of them had contracted the disease. What was perhaps even more remarkable was that in only one of the twenty-two cattle which were inoculated or fed with large doses of the bacilli did the disease reach what may be called a clinical stage. In

one other case the bowels had been loose for some weeks before the animal was killed, eighteen months after inoculation, but in the remaining cases in which infection actually took place no symptom pointing to the existence of the disease was exhibited during life, and the fact that the experiment had had a positive result was only determined by the discovery of disease of the intestine after death.

The experiments with sheep had very similar results. Out of eight of these animals inoculated intravenously only three became infected, and only one of these showed any symptom suggestive of infection.

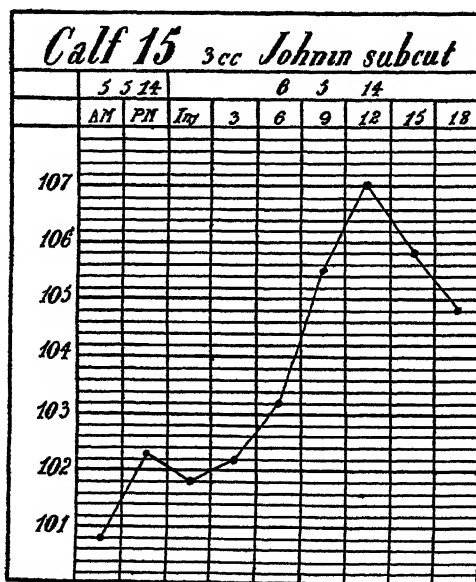


Chart I.

One of the principal objects of the experiments was to determine whether it was possible to obtain from the bacilli of Johne's disease a substance analogous to tuberculin, which might be relied upon as a test for the existence of Johne's disease. Although there is scarcely any resemblance between Johne's disease and tuberculosis in respect of the seat and appearance of the lesions, the bacilli which are the cause of the two diseases are remarkably alike. It is for this reason that some authors employ the term para-tuberculosis to designate what is usually termed Johne's disease in this country.

In keeping with this similarity in the appearance of the two species of bacteria is the fact, first discovered by O. Bang, that cattle affected with Johne's disease will react to avian tuberculin, that is to say, tuberculin prepared from the particular strain of tubercle bacilli which is the cause of tuberculosis in birds.

Considerable use has in recent years been made of avian tuberculin in testing animals suspected of Johne's disease, but a defect in the test is that avian tuberculin also produces reactions in cattle that are affected with tuberculosis. The results of the test are therefore uncertain when it is employed in herds not known to be free from tuberculosis, since a positive reaction may be due to infection with either disease.

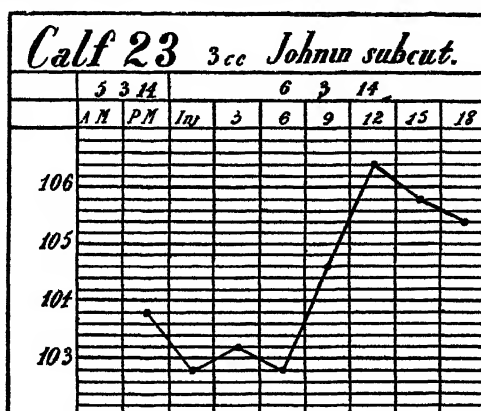


Chart II.

It was therefore clearly indicated to attempt to prepare a test fluid from the bacilli of Johne's disease, in the hope that this would prove capable of causing what is termed a "specific" reaction, or, in other words, that it would cause a rise of temperature in animals affected with Johne's disease, but not in tuberculous subjects. There was some reason to hope that a substance prepared from the bacilli of Johne's disease would not cause a reaction in tuberculous cattle, since it was already known that ordinary tuberculin will not cause a reaction in the subjects of Johne's disease.

During the last few years comparatively large quantities of a substance which is conveniently termed "Johnin" have been prepared at the Royal Veterinary College from pure cultures of Johne's bacilli, and numerous tests with this material have been carried out on healthy animals as well as on those suffering from Johne's disease or from tuberculosis.

As a result of these observations it can be stated that Johnin is capable of producing a reaction in animals affected with Johnne's disease, the reaction being almost exactly of the same nature as that which tuberculin causes in a tuberculous subject.

The accompanying chart (No. I.) shows the manner in which the temperature rises and falls when an animal affected with Johnne's disease is reacting to this test.

Unfortunately it has also been proved that the test is not specific, since it may provoke an equally pronounced rise of temperature in an animal which is free from Johnne's disease but affected with tuberculosis. Chart II. shows the reaction in such a tuberculous animal.

CONTAGIOUS ABORTION.

During the year investigations with regard to contagious abortion in cattle were continued, and 1,688 samples of blood from diseased and suspected animals were submitted to the agglutination test in the laboratory. It will be recalled that the object of this test is (1) to ascertain whether a case of abortion which has occurred in a herd is of the contagious kind or not, and (2) when the occurrence of the contagious disease has thus been positively diagnosed to ascertain by testing the whole of the animals to what extent the disease has spread among them. With the knowledge thus provided it is possible to advise what is the best course to adopt in order to eliminate the disease. Members of the Society are reminded that this work is still being carried on, and that in cases in which the circumstances appear to make a general test of the whole herd useful this will be carried out free of expense.

Members of the Society are particularly urged to apply to the College for assistance in diagnosis when the FIRST case of abortion occurs, and not to wait until a number of animals have slipped their calves.

During the ensuing year it is proposed to carry out a special investigation with regard to the cause of abortion in mares, and members of the Society who have any cases of that kind, or cases of naval ill or joint ill in foals, are requested to place themselves in communication with the Principal of the College. Any investigation of an outbreak which may be made will be conducted free of expense to the owner.

JOHN McFADYEAN.

Royal Veterinary College, N.W

ANNUAL REPORT FOR 1916 OF THE CONSULTING CHEMIST.

THE exceptional circumstances of last year, which affected so much the work of the Chemical Department of the Society, have unfortunately continued and have shown their influence in a still further reduction in the number of samples submitted by Members. This number stands for 1916 at 260 as against 300 in 1915.

There were, in addition, 154 samples of milk (44 being of goats' milk) and 25 samples of cider and perry examined in connection with the County Show at Manchester.

The marked feature of the year as regards both fertilisers and feeding stuffs has been the continued rise in prices combined with difficulty of obtaining the articles. Many factories which formerly were employed for the manufacture of artificial manures have now been commandeered by the Government and are devoted almost entirely to the turning-out of sulphuric acid (oil of vitriol) for munition uses. In consequence it has been difficult to procure even such a common article as mineral superphosphate, and recourse has had to be taken to the wider employment of untreated phosphates, such as ground mineral phosphates and basic slag. Even the latter has been hard to procure, and difficulties of shipment and transport have caused a like scarcity and rise of price. Even more, perhaps, has this been found to be the case with feeding stuffs, the prices of which have risen phenomenally. Mention was made in last year's report of linseed cake reaching 12*l.* a ton; it is now 15*l.* to 15*l.* 15*s.*, and cotton cake is over 12*l.* a ton. Sulphate of ammonia, no longer reserved at a fixed price of 15*l.* per ton for the British farmer's use, has risen to 17*l.* 5*s.*, with nitrate of soda at the like price or rather more.

The hopes entertained that a substitute would be found for the potash salts hitherto obtained from the Stassfurt (Prussia) mines have not been realised, and there is a practical dearth of potash. How long the land will continue to yield satisfactory crops without renovation of its potash supply it is hard to say, but it is clear that on light sandy and chalky soils the want of potash is bound to tell before long, and especially where fruit and vegetables, hops and root-crops generally are grown. It has, however, been now ascertained beyond doubt that in the north of Spain there exist supplies of potash salts similar in nature to those of Stassfurt, and it is greatly to be hoped that negotiations with the Spanish Government will be speedily entered into to set this source of supply free for use.

The war conditions have facilitated the supply from our West Indian and African possessions of certain feeding materials, chief among which are palm-nut and coco-nut, and which formerly went mainly to Germany. Earthnut cake also has been more extensively used, and is certainly at the present time one of the most economical of purchased foods.

The calf-rearing experiments conducted at Woburn, in which it was shown that palm-nut meal could be successfully employed, given with water only, in the rearing of calves, have no doubt stimulated the use of this meal. At the same time it is well to point out that palm-nut meal is obtainable of different qualities, for, not only is the oil expressed from the kernel in the usual method of oil-pressing, but the oil may also be further extracted by chemical solvents, so that meal with different percentages of oil down to almost none at all may now be obtained. The meal used in the Woburn experiments contained 6.73 per cent. of oil. It is satisfactory to record that but few instances have occurred of either palm-nut cake or coco-nut cake not keeping well, and the contemplated difficulty of their soon turning rancid on storing has evidently been got over.

Notwithstanding the diminution in the number of samples sent for analysis there has been abundant proof afforded that the Society's laboratory is needed, and that Members would do well to exercise their chemical privileges more. References will be made later to such instances. Special mention is also made of the change that has been forced upon the manufacture of "soft soap" for hop-washing purposes owing to the impossibility of obtaining potash salts and the substitution of soda salts for them.

During the year representations have been made to the Board of Agriculture on three different subjects, viz.: (a) the supply of sulphate of ammonia; (b) the guarantee necessitated in the case of the sale of dissolved bones, bone manures, &c; (c) the guarantees required on the sale of linseed cake. In regard to sulphate of ammonia—which was practically the one home-produced nitrogenous salt—it was urged that the export of this should not be allowed until a sufficient supply was available for agricultural use in this country. This concession was allowed for a limited time, during which sulphate of ammonia could be purchased at a fixed price of 15s. per cwt. In respect of dissolved bones, bone manures, &c., a practice had sprung up of stating the phosphates not in terms of *water* soluble and insoluble phosphates as previously, but in terms of the phosphates soluble in *citric acid*. When bones and other phosphates are "dissolved" it is understood that they are dissolved in oil of vitriol, and that by "soluble phosphate" is

meant the phosphate soluble in *water*, and it was felt that the extension of the term "soluble" to what was soluble in *citric acid* would be misleading. It was found, however, that such a practice as was complained of was permissible under the Fertilisers and Feeding Stuffs Act, as it now stands, but it is very desirable that in any amendment of the Act this point should be borne in mind. A similar need of amendment of the Act is called for in the case of the guarantee given with linseed cake and other feeding materials of single and definite nature. The Act states in effect that if a feeding stuff be sold under a description or name indicating that it is the product of any definite substance or seed, it shall be "pure," *i.e.*, be made from that substance or seed only. If, for instance, a cake is described as "Linseed Cake," it must be "pure," *i.e.*, composed of linseed only. To avoid the consequences of the Act, a practice has sprung up among manufacturers and vendors of putting on their invoices a "saving clause" to the effect that unless the articles be specially described as "pure" they must be taken to "be prepared from more than one substance or seed." This is, in effect, to do away with the force of the guarantee contained in the use of the particular term by which a feeding stuff is sold. In other words, a vendor may invoice a cake as "Linseed Cake," and by putting on his invoice the "saving clause" alluded to, may be relieved of the consequences of selling a cake that does not rightly answer to the description "Linseed Cake," a description which implies that the cake shall be "pure." This is a practice which should undoubtedly be put a stop to, and, extended as its use is also to the case of offals, it threatens to destroy the whole security which the purchaser ought to have under the Act.

Reference may be usefully made to the Farmers' Milk Competition held in connection with the Society's Show at Manchester. As the outcome of the previous competition, held at Nottingham in 1915, considerable alarm was felt by dairy farmers and the public vendors of milk as to the difficulties they would be met with in complying with what is known as the "Government Standard" for milk, *viz.*, 3 per cent. of fat and 8.5 per cent. of solids-not-fat. An examination of the results put forward after the Nottingham competition indicated that in a large number of cases the senders of milk into Nottingham, from presumably natural and pure sources, would have failed to comply with the requirements of the Sale of Food and Drugs Act, and so might have rendered themselves liable to prosecution. The results obtained this year at Manchester, however, tell a very different story, for, out of the whole number of milks analysed—and there were 59 different herds entered—in only one case did the figures fall below the

"standard." For the entire series the following excellent averages were shown:—

	Fat Per cent	Solids-not-fat Per cent.
Morning milk	3.45	8.99
Evening milk	3.85	9.07

The results of the analyses of the samples taken at Manchester (which, it may be added, looks well after its milk supply) show that the present "standard" is by no means too high, and that there should be no real difficulty in complying with it.

I pass now to consider, as usual, in detail, features of interest that have occurred in my laboratory practice during the year.

A. FEEDING STUFFS.

1. *Linseed Cake and Meal.*

But few samples of linseed cake were sent, but these were uniformly pure. In one instance of the sale of linseed meal, this was found to be not, as one might expect, the seed merely crushed and containing all its oil, but to have the oil pressed out just as in the making of linseed cake. The analysis was:—

	Per cent
Oil	11.33
Sand	2.79

In addition to containing excess both of weed seeds and sand, the meal was distinctly acid and in bad condition.

2. *Decorticated Cotton Cake and Meal.*

Among the few samples of these sent was one of a material sold as "Cooked Decorticated Cotton Seed Meal" at (in October, 1916) 13*l.* 2*s.* 6*d.* per ton. On analysis this gave:—

	Per cent.
Moisture	14.34
Oil	8.82
Albuminoids	29.19
Soluble carbohydrates, &c.. . . .	20.56
Woody fibre	14.08
Mineral matter	13.01
	<hr/> 100.00
Nitrogen	4.67
Including sand	10
„ salt	8.77

This, it will be noticed, compares very badly with good decorticated cotton seed meal, even at its then high price of

14l. 10s. per ton, for the meal was badly decorticated, and one does not want to pay for common salt at the rate of 13l. a ton.

3. *Earthnut (ground nut) Cake.*

Though good and sound samples of this useful feeding stuff are often met with, care has to be exercised in purchase owing to the tendency for the cake to be found to contain excess of sand, as illustrated by the following cases :—

	A	B
Moisture	7.98	9.37
Oil	10.17	8.25
Albuminoids	45.50	42.31
Soluble carbohydrates, &c.	22.89	22.01
Woody fibre	5.18	8.09
¹ Mineral matter	8.28	9.97
	<hr/> 100.00	<hr/> 100.00
Nitrogen	7.28	6.77
¹ Including sand	3.96	4.50

A, which cost 9l. 12s. 9d. per ton in November, 1915, at Gloucester, was also distinctly acid.

4. *Rice Meal and Bran.*

The price of rice meal has gone up tremendously and out of all proportion, I consider, to the real value of rice meal as a feeding material. The following instances show the need of care in the purchasing of it or other products of rice :—

	A Rice Meal (so-called)	B Rice Meal	C Rice Bran (so-called)
Moisture	13.30	52.05	—
Oil . . . . .	.43	—	6.48
Albuminoids	2.44	—	—
Soluble carbohydrates	78.78	—	—
Woody fibre	2.52	—	—
¹ Mineral matter	2.53	2.12	16.12
	<hr/> 100.00	<hr/> —	<hr/> —
Nitrogen . . . . .	.39	—	—
¹ Including silica . . . . .	.25	.30	13.08

"A" was offered in the Nottingham district as "Rice Meal" for fattening pigs. On examination it was found not to be rice meal at all, but tapioca starch refuse, and was almost destitute of oil and albuminoids.

"B" was sold as "Rice Meal," at 6l. per ton in Essex (September, 1916). It was in a wet, pasty condition, and extremely acid—more than half of it was water.

"C," though sold as "Rice Bran," and costing 5*l.* 10*s.* per ton at West Hartlepool in January, 1916, was nothing more than the husks or "shudes" of rice, together with a little broken rice grain.

5. *Miscellaneous Feeding Materials.*

- (a) Cocoa husks.
- (b) Molasses Feed.
- (c) Sweepings.

(a) The following is the analysis of a sample of cocoa husks or shells, a refuse material obtained in the manufacture of cocoa (cacao).

Moisture	9 72
Oil	11 35
Albuminoids	17 06
Soluble carbohydrates, &c.	40 79
Woody fibre	14 83
Mineral matter	6 25
	<hr/>
	100 00
	<hr/>
Nitrogen	2 73

This cost in April, 1916, 6*l.* per ton, and was intended to be used for milking cows. For this purpose it might do quite well.

(b) Under the name of "Molasses Feed," was sent me a material which had all the appearance of heated silage, mixed with some chaff. It had a burnt smell and pungent taste, and whatever sugar it may have contained had been destroyed. It further contained 7·57 per cent. of sand. It had cost 7*l.* 15*s.* per ton in February, 1916, but the vendors subsequently admitted something being wrong with it!

(c) Sent under the name "Feeding Meal," I received a sample which proved to be little more than "sweepings," consisting of weed seeds (polygonum and cockle seed mostly) with barley clippings. It contained 3·50 per cent. of sand. The material was stated to be the waste from dressing barley at a brewery, and the cost was (in December, 1915) 4*l.* a ton.

B. FERTILISERS.

1. *Ground Phosphate.*

Owing to the difficulty in procuring superphosphate, various forms of phosphatic materials, ground finely, have come into use. The following material cost (in March, 1916) 4*l.* 10*s.* a ton, and was by no means dear. The fact that it supplied a considerable amount of lime to the land is further in its favour.

Moisture	2.76
¹ Phosphoric acid (total)	26.56
Lime	43.61
Oxide of iron, alumina, &c.	20.26
Insoluble siliceous matter	6.81
	<hr/> 100.00
¹ Equal to tribasic phosphate of lime	58.24
Phosphate of lime soluble in 2 per cent. citric acid solution	18.88

2. Basic Slag.

Basic slag of good quality has been hard to get, and this fact has no doubt given an impetus to the sale of inferior qualities. To this no objection can be raised provided they are sold at relatively low prices. This, however, is not always the case, as shown by the following instance of a basic slag sold (in October, 1916) under the name "Reliance Basic Slag" at the price of 65s. per ton for five-ton lots. The analysis was :—

Total phosphate of lime	Per cent. 21.04
Phosphate of lime soluble in 2 per cent. citric acid solution	17.61
Lime	38.39
Silica	21.26
Fineness	85.30

This gives the unit value for phosphate of lime as 3s. 1d., which must be considered, even at present high prices, decidedly dear, for the best qualities can still be obtained for 2s. a unit of phosphate of lime or even less.

3. Peruvian Guano.

Though the supply of this material is short, good samples are occasionally still to be met with. One such was the following :—

Moisture	Per cent. 6.33
Organic matter and salts of ammonia	40.68
Monobasic phosphate of lime	12.50
(equal to soluble phosphate of lime)	19.57)
Insoluble phosphates	7.19
Sulphate of lime, alkaline salts, &c.	30.32
Insoluble siliceous matter	2.98
	<hr/> 100.00
Nitrogen	6.78
equal to ammonia	8.23

This was Dissolved Peruvian Guano and cost (in November, 1915) 10*l.* a ton delivered, a price which, under all the circumstances, cannot be considered too dear.

4. *Bone Manure.*

One is naturally suspicious, as a rule, of waste materials obtained from slaughter houses, but the following, sold as "Bone Manure" at 6*l.* 10*s.* per ton in December, 1915, was in good condition and well worth the price :—

	Per cent
Moisture	9.03
Organic matter	43.61
Phosphate of lime	40.39
Carbonate of lime, &c.	6.33
Sand	6.4
	<hr/> 100.00
Nitrogen	5.03
equal to ammonia	6.11

5. *Soot.*

I have often had occasion to refer to the care that should be taken in the purchase of Soot. A further instance is afforded by the following, where Soot was sold in Bedfordshire in April, 1916, at 50*s.* per ton, and was found on analysis to be of very inferior quality. It gave :—

	Per cent
Moisture	13.59
Organic matter and salts of ammonia	22.65
Oxide of iron, &c.	36.42
Insoluble siliceous matter	27.34
	<hr/> 100.00
Nitrogen	1.25
equal to ammonia	1.52

A good sample of Soot should give about 4 per cent. of ammonia, and 30*s.* a ton, carriage paid, would have been quite enough for the above.

6. *Nitrogenous material.*

This is another instance of where caution in purchase is required, for nitrogenous material is a vague term that may mean almost anything. The material in question was stated to have been specially treated so as to render the nitrogen readily available. The analysis shows that this was hardly the case, and the price, 5*l.* a ton in January, 1916, was far too much.

	Per cent
Moisture	12.00
Total nitrogen	6.28
equal to ammonia	7.62
Soluble nitrogen	1.79
equal to ammonia	2.17

7. Salt from Gas Works.

A sample was submitted to me in March, 1916, which was stated to be Salt from Gas Works in the outskirts of London, and which could be got for 1*l.* a ton. On analysis it was found to be composed as follows:—

	Per cent
Moisture	9.55
Chloride of sodium (common salt)	68.51
Nitrate of soda	8.20
Chlorides of calcium, magnesium, &c.	13.74
	100.00

This was not ordinary salt but contained a not inconsiderable amount of nitrate of soda, together with chlorides of calcium and magnesium, which rendered it very moist. Still, at 1*l.* a ton it was quite worth getting.

C. MISCELLANEOUS.

1. Milk.

As mention has been made of the milks analysed in connection with the Farmers' Competition at Manchester, it may be well to give also the following results of samples sent direct by members.

The first was of the mixed milk of a herd of 35 non-pedigree Shorthorn cows near Warwick, the others were samples from 5 pedigree British Holstein-Friesian cows from a farm in Essex.

	Shorthorns	A	British Holstein-Friesian			
			B	C	D	E
Water	87.31	87.52	86.89	86.88	85.91	86.96
Fat	3.50	3.90	4.15	4.30	5.00	4.65
Solids-not-fat	9.19	8.58	8.96	8.82	9.09	8.39
	100.00	100.00	100.00	100.00	100.00	100.00

These bear out the comments I made as to the adequacy of the present legal standard, and it will be noted that the figures for the Holstein cows are decidedly high for this breed. There is no question, however, that the efforts being made to improve the quality of the milk of this breed are bearing fruit.

2. Soft Soap.

It has been mentioned that, in consequence of the shortage of potash salts, soda salts have had to take their place, and this

has occurred with the manufacture of soft soap for hop-washing and similar uses. Hitherto soda salts have been used for making what are known as "hard" soaps and potash for "soft" soap, but the ingenuity of manufacturers has been exercised in the production of a "soft" soap made with soda in place of potash, and, by the utilisation of particular kinds of oil, the efforts have been successful in producing a material answering the description "soft" soap, and which, provided that it contains a proper proportion of true soap, should do quite well for hop-washing, &c. As the following analyses show, however, samples may vary very much in quality. A good "soft soap" should contain about 40 per cent. of fatty acids and not have much above 45 per cent. of water.

	A	B	C	D	E
Water . . .	49.76	39.48	58.48	68.26	83.81
Fatty acids . .	44.06	53.13	35.55	24.89	10.29
Alkali, &c. . .	6.18	7.39	5.97	6.85	5.90
	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>

"A" and "B" were both quite good samples, especially "B." They cost respectively 24s. per cwt. and 28s. per cwt. "C" was of fair quality, the water being, however, rather high. "D" was distinctly inferior, while "E," which cost 16s. 6d. per cwt. and was known as "Triumph Soft Soap," could only be said to be a "triumph" in the way of combining a great deal of water with a very little soap.

The list of samples submitted to me by Members during the twelve months December 1, 1915, to November 30, 1916, is as follows:—

Linseed cakes and meals	12
Uncorticated cotton cakes	5
Decorticated cotton cakes	3
Compound feeding cakes and meals	27
Palm nut cakes	2
Ground nut cakes	5
Soya bean cakes	4
Maize meals	3
Rice meals	4
Dried grains	5
Cereals, offals, &c.	8
Silage	2
Superphosphates	3
Dissolved bones	5
Compound manures	13
Raw and steamed bones	2
Peruvian guano	4
Meat guano	2
Basic slag	17

Ground phosphates	1
Nitrate of soda	1
Sulphate of ammonia	6
Nitrolim	2
Shoddy	30
Refuse manures	4
Soot	1
Lime, chalk, &c.	6
Waters	27
Milk and butter	34
Soils	11
Soft soaps	6
Miscellaneous	5
Total	260

J. AUGUSTUS VOELCKER.

1 Tudor Street, E.C.
December, 1916

REPORT OF CONSULTING BOTANIST, 1916.

THE work of the Botanical Department has been carried on on the same lines as in former years, and the unusual conditions of the present day Agriculture have made less difference to it than might have been expected. The inquiries from the numerical standpoint were much the same as in 1915, and their distribution over the four main sections of our work, namely, seed testing, fungoid diseases, weed identifications, and general inquiries, was very similar. It is difficult to discuss them in any detail for they range over so wide an area. Consequently, the plan has been adopted of describing the most important, or the most interesting features in a few paragraphs devoted to each section in turn.

SEED-TESTING.

Some of the samples of perennial rye grass and of red clover were excellent, but, taking the seeds as a whole, neither the purity nor the germination were up to the standard of previous years. However, there was little real cause for complaint, except in five cases. Two of these bad samples were wheat, one rye, one peas, and one tares. In each case the seeds had been assumed to be good, and it was only the failure to secure a plant which led to requests to have them tested. The germination was then found to range from about 20 to 40 per cent. Had these tests been made earlier such seed would probably never have been sown. It is a strange fact that, if one may judge

from the number of samples received year by year, little attention is paid to the germinating capacity of large seeds. But they require it, if anything, more than the smaller seeds, such as those of the grasses and clovers. Three of these bad samples had every appearance of being good, and one could well understand that anyone not accustomed to view every seed sample with suspicion would assume that they were suitable for sowing without any preliminary testing.

Seeds of farm grasses, apart from Italian and perennial rye grass, were only received from two members, whilst only one mixture, and that an indifferent one, suitable for the formation of lawns, had to be examined. The results of the analyses consequently do not afford any accurate idea of the quality of the grass seeds available during 1916. The figures for the clovers, where sufficient numbers were tested to strike a fair average, were as follows:—

	PURITY.	GERMINATION.
Red Clover	97.8	92
Trefoil ...	98	89 + 6 per cent "hard" seeds
Lucerne ...	99.2	91 + 5 per cent "hard" seeds.

The various cereals were on the whole good, though more samples with a germinating capacity of less than 90 per cent. were met with than is usually the case. As in previous years, this was particularly the case with the oat crop. Judging from analyses already made of the 1916 crops, there will be considerable quantities of indifferent cereal seeds on the market this season.

PLANT DISEASES.

A particularly striking feature of the inquiries received during the late summer and early autumn months was, as compared with other years, the excessive number dealing with the diseases of cereals. Ordinarily, plant diseases account for some forty to fifty inquiries, but this year over sixty were concerned with the cereal crops alone. Their number, and the fact that they came from all parts of the country, indicated an unusual prevalence of disease, and foreshadowed, as we now know to be the case, that the average yield, promising as the crops appeared to be, would be a low one. The yellow rust, a disease now generally recognised, only accounted for three of these inquiries, and the bulk of them were due to the attacks of little-known parasitic fungi, such as *Leptosphaeria*, *Ophiobolus*, *Cladosporium* and *Septoria*. *Leptosphaeria* was shortly described in the last annual report (p. 311, 1915), from specimens from mid-Wales. This year it was received from Cornwall, Worcestershire, Yorkshire, Lincolnshire, and Norfolk. In every instance it had completely killed the plants soon after the flowering stage was

reached. In answer to inquiries I learnt that the attack was not general in any of the affected fields, but only occurred in small, isolated patches. These were not, as a rule, particularly numerous, except in one case, where it was estimated that a third of the crop had been attacked.

Specimens of wheat attacked by *Ophiobolus*, the "Take-all" fungus, were received for the first time this year, but the disease is probably more prevalent in most years than this fact would appear to indicate. The ears of the infected plants were shrivelled, grainless, and taper-pointed. They had apparently died away soon after pushing clear of the leaf-sheaths. In none of the cases reported was the damage really serious.

Cladosporium seems to have been particularly abundant, though possibly its numerical frequency may have been due to the fact that the dark greenish-brown ears of badly infected plants are particularly obvious and so attract attention. The fungus is very common as a saprophyte and occurs almost invariably, if not invariably, on leaves which have been killed off by rust or mildew. There is little doubt that it can also be an active parasite, and I am inclined to think this was the case in several of the specimens sent to the Botanical Department. But there was no definite proof of this beyond the fact that the ears had been attacked at too early a stage of growth for them to have been killed by rust previously.

One species of *Septoria* is usually abundant on wheat, causing small black dots on the foliage and chaff without appreciably damaging the crop. Two specimens of ears of wheat bearing conidia, apparently of some *Septoria* species, were received with the report that the disease was very prevalent and would cause a considerable loss.

Another disease, received from two different sources, is worth putting on record on account of its rarity in this country. This is the "ergot" of wheat. Ergots are very common on some of the grasses and also on rye, but their occurrence in wheat is distinctly unusual. In both cases the variety attacked was Essex Conqueror.

In addition to these more or less unusual diseases a few specimens of badly bunted grain were received after harvest.

Mildew on oats appears to have been very prevalent this season, and has caused more damage than usual. It is usually confined to the leaves and the lower portions of the stems, but in the cases sent for examination the panicles themselves were badly attacked.

In addition to specimens of "blind" ears of barley, resulting from attacks of *Helminthosporium*, several specimens were received in which from two to eight of the grains had failed to set. The disease is a very widespread one,

particularly in broad-eared barleys such as Burton Malting, and in East Anglia in Goldthorpe. So far all attempts to find its cause have failed, though the disease has been under observation for some years, but the fact that in every case examined specimens of *Thrips cerealium* have been found is probably significant.

Inquiries with regard to potato diseases were rather numerous, possibly owing to the lack of opportunities to keep the crops sprayed. No specimens of either of the scheduled diseases, corky scab or the black wart disease, were received, and the majority consisted of "curl" and the common potato disease. The former can be eliminated by securing a change of seed every two seasons, whilst Bordeaux mixture is an efficient fungicide for the latter.

None of the fungi attacking fruit trees were of any special interest. They included mildew and scab on the apple, brown rot on fruits of the apple and plum, and also on branches of the apple Cox's Pomona, and grey mould on strawberries.

WEEDS.

Of the various weeds received for identification spurrey was again the most frequent, followed closely by black twitch and the common florin, which appears to have been unusually prevalent as a weed amongst cereal crops in East Anglia. The greenweed or dyer's genista, one of the worst weeds of pastures in some parts of the country, was received from the Isle of Wight and also from Gloucestershire. In view of the extreme difficulty of eradicating it by pulling or even by thorough digging, experiments have been made during the past two seasons to determine whether the use of artificial manures, more particularly sulphate of ammonia, would be advantageous. Unfortunately the results are not promising, but as the problem is of some importance a fresh series of experiments will be started.

One of the most curious weeds yet sent to the Botanical Department is the white stonecrop (*Sedum album*). It is a common garden plant which frequently escapes from cultivation and establishes itself on dry stone walls or cottage roofs or in almost any well-drained position. In this case it had found its way on to light arable soil and established itself effectively enough to become a nuisance. It will probably be difficult to get rid of by ordinary tillage operations, for any fragment of the plant, even a single leaf is capable of rooting down and forming the starting point of a new clump. Another member of this same family, the Orpine sedum, was reported from arable land in Suffolk. This again is probably a garden escape. Like the previous

species it is exceedingly difficult to kill by any process of tillage, but in this case hand-pulling will soon rid the field of its presence.

The remaining weeds on which reports were sent during the year were ragwort, field-madder, charlock, smooth-stalked meadow grass, knapweed, dove's-foot cranebill, bistort, grom-well, goutweed, and shepherd's needle.

GENERAL INQUIRIES.

Under this heading are included any inquiries not classifiable under either of the three main sections of the Department's work. They are often especially interesting, but at the same time difficult to describe in a short report. Two dealing with seed wheat had some general interest. The first dealt with the advisability of obtaining a change of seed, and further information was required as to the best change for a thin brashy soil overlying the oolite. Very little definite information exists on this subject, and the few experimental data available indicate that a change does not as a rule lead to any marked improvement of the yield of any given variety. It has its uses, however, if a pure stock of seed can be obtained to take the place of one which has become mixed with other varieties. This is especially the case with barley, where admixture is readily recognised by dealers, with the result that low prices have to be accepted. The problem of obtaining greater yields per acre by the use of special seed-corn suggested to another Member the question as to whether this result could not be obtained by inter-crossing wheats of the same kind, instead of allowing them to be "selfed," and using the resulting seeds as the starting point of a new strain. The idea is an attractive one, and good results have been claimed for it, but the results of critical experiments on the subject do not show that it has any value in practice. Where different varieties are crossed the progeny are often strikingly vigorous, but this extra vigour is not apparent in succeeding generations.

Information was also required with regard to varieties of wheat suitable for light soils in wind-swept localities and oats for cultivation at high elevations in the North of England. Several more inquiries were again received concerning the cultivation of the two important drug plants, henbane and deadly nightshade, and actual or supposed parts of these plants, and also of valerian, were sent in for identification. Specimens of sphagnum moss for surgical use were also reported on.

In the Report of the previous year (page 312, 1915) a reference was made to the fact that seed sown as swede had produced a number of rape-like plants. The phenomenon is one of considerable interest, and accordingly an attempt was made to

investigate it. Seed guaranteed to be from the same bulks as that producing the "rogues" was obtained from two seed merchants, and a plot of about an acre in extent sown with it. No abnormal plants occurred. This may indicate that the production of the rape-like plants is dependent solely on some conditions of cultivation not recognisable at present. Attempts to obtain seed from the abnormal plants have so far failed, but they are still living, and give promise of growing into a third season.

Perhaps the most unusual inquiry yet received was one concerning the methods of cultivating woad and extracting the blue dye from it. The growth of the crop has practically been abandoned in this country, and to the best of my knowledge it only survives in one locality in the fens. Two centuries ago woad-growing was a flourishing industry, but the importation of indigo killed it. This in turn was more or less driven out of cultivation by synthetic indigo. Possibly the growing of woad on a small scale would be profitable now-a-days, for it is useful, not so much as a dye, but for fixing the colour in goods dyed with artificial indigo and other dyes. However, the question did not arise, for my correspondent's soil conditions were unfavourable for the purpose.

Amongst the other subjects dealt with were the value of wild white clover; several problems connected with the growing of swede and mangold seed; the pruning of newly planted fruit trees; the renovation of lawns; the best periods for certain spraying operations and the constitution of various fungicidal washes; and the presence of certain weeds as indicators of soil conditions.

I have to thank several Members for sending specimens and information regarding the yields per acre of some of the newer varieties of cereals. When sufficient data on the subject have been collected they will be embodied in a future report.

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ANNUAL REPORT FOR 1916 OF THE ZOOLOGIST.

THIS year has been remarkable for the number and severity of the attacks of injurious insects. It has, perhaps, been most noticeable with regard to the caterpillar tribe—the larvæ of various moths—but pests of all sorts have abounded, and some that are of rare occurrence have put in an appearance. The

majority of the cases referred to this department have presented no new features which demand special comment, and in the following pages it is only attempted to give an outline of the scope of the year's work, with more extended notes on those pests which were particularly interesting, either on account of their rarity or of new observations furnished by them. There have been many inquiries with regard to animal parasites, partly in connection with army medical work. Under this section it has been thought well to give a prominent place to the warble-fly, whose life-history has only recently been fully traced.

FOREST TREE PESTS.

Various leaf-eating caterpillars were very active in the early summer, and there were severe local attacks of oak tortrix, lackey moth, and gold-tail moth. Applications in regard to other forest pests were not as numerous as usual, though odd cases of attack by pine beetle, siren, larch bug, and cockchafer were reported. The elm bark beetle, *Scolytus destructor*, is one of the best known enemies of forest trees, and has been very thoroughly studied, but the number of elms brought down by the blizzard in March afforded an opportunity of making some interesting observations with regard to it. In Cambridge, where bail attacks of this pest occur from time to time, it was surprising that most of the old elms brought down by the storm showed no sign of it. A few trees which had been cut down in the winter to clear land for building were, however, a very fertile field for exploration. Some of them were full of the bark-beetle grubs, two species being concerned, *S. destructor* and *S. multistriatus*, but other trees, close at hand, were entirely free. Mr. Keilin, of the Quick Laboratory, Cambridge, examined some of the grubs with a view to investigating their parasites, which he found to be numerous, including a fungus and an eel-worm, and some pathogenic bacteria, but the most interesting was a mite of the genus *Pediculoides*, to which he called my attention in June. Further investigation showed that this mite was fatal to a large number of the *Scolytus* grubs, and that it was of a species hitherto unknown. It seemed possible that it might be of real utility in helping to control the deadly enemy of elm trees, and much time was devoted to investigating its life-history.

These mites of the genus *Pediculoides* are remarkable creatures. The females are at first very minute, but after attaching themselves to a soft-bodied grub, such as that of a beetle or a bee, the hind end of the body swells out until finally the body and legs bear about the same proportion to the swollen tail as the stalk of an apple to the fully developed fruit. This swollen female gives birth to males and females already mature, and the females spread abroad to attack other grubs. Mites of

this group have been found feeding on the beetle grubs attacking stored grain, and the cases which occasionally occur of irritation to the hands of people handling grain are traceable to these creatures. This place is not suitable for a scientific description of the new mite and its life-history, but, unhappily, it appears that it is not likely to be of great use to the forester. In the infested trees, though many beetle grubs were destroyed by it, large numbers survived, but the most disappointing circumstance was its apparent inability to accompany the beetle when attacking new trees. As was stated above, there were some felled elms quite free from *Scolytus* in the same plot of ground as the infested trees, and though these were at once used for the purpose of egg-laying by the beetles which came out, the parasite did not succeed in getting across, though they were swarming in the bark of a tree only a foot or two away.

Pediculoides is a genus of mites of the family *Tarsonemidae*, of which another genus, *Tarsonemus*, is vegetarian and includes the "Begonia mite." It may be incidentally mentioned that a species of *Tarsonemus*, probably new, was found plentifully in the burrows of the elm-bark beetle, and accompanied it in its flights to fresh trees, probably with the intention of feeding on some fungus growing in the tunnels.

FARM AND GARDEN PESTS.

Attacks by injurious insects on nearly all farm and garden crops have been unusually severe. The commoner pests have been very abundant—seldom, for example, have cabbage caterpillars been more numerous—and insects very seldom complained of have put in an appearance. The list includes the following pests: Attacking corn and grass—Hessian-fly, wheat bulb-fly, frit-fly, wire-worm, leather-jacket, and chafer grubs; attacking root crops—surface caterpillars, root maggots, aphids, mangold-fly, and the pygmy mangold-beetle; attacking miscellaneous farm and garden crops—aphids of various species, pea-thrips, pea-midge, pea-moth, celery-fly, asparagus-beetle, eel-worm disease in onions, and many other infestations. Most cases possessed no special interest, but in connection with some of them a few notes are desirable.

Wheat bulb-fly.—Wheat bulb-fly has been a well-known and destructive pest for many years, but it still baffles all attempts to deal with it. Corn pests in general are difficult to combat, except by some variation in cultural methods which shall interfere at some point with the insect's life-cycle, and to devise the appropriate change of method we must first know the life-cycle accurately, and there are points still unknown in the life-history of this particular fly, namely, how and where the eggs are laid, and what the maggot is like on first hatching out.

It appears a perfectly simple matter to catch some newly emerged flies, supply them with young wheat or grass plants, and observe them laying eggs, but the trouble is that this insect, unlike many other flies, apparently does not lay eggs till long after it emerges, and dissection shows its ovary to be in a very immature state of development.

A Russian investigator, M. Kordiumoff, has recently claimed to have solved the problem. One of his flies laid eggs at a moment when it was not under observation, and he had to search the plants and the soil within the enclosure. He found *some* eggs, which he believed to be those of the fly, in the soil, and managed to obtain first-stage larvæ. He described these as the earliest stage of the wheat bulb-fly grubs, and concluded that the eggs were laid broad-cast in the soil.

Now this is in the highest degree improbable, for it is the invariable habit of insects which affect certain plants to lay their eggs on those plants and nowhere else. But there is a stronger reason for thinking the Russian entomologist mistaken. There is a characteristic difference between the mouth parts of carnivorous and vegetable-feeding fly maggots, and Mr. Keilin, who is one of the best authorities on this point, is quite clear that Kordiumoff's maggot belongs to the former category, and has nothing to do with the wheat bulb-fly, and we are, therefore, still in the dark as to the early history of the pest.

When complaints are received the attack is always far advanced, and its earliest stages have been missed. An attempt will be made to observe its first appearance in autumn-sown wheat, but it does not seem too hopeful when there is no certainty that it will occur at all in the particular crop examined.

Pygmy mangold-beetle.—No case of attack by the pygmy mangold-beetle had come to my notice since 1907. It then occurred in Essex, and an account of it was given in the Zoologist's Report in the 1908 Journal. This year the pest cleared off the greater part of a field of young mangolds in Cambridgeshire. It is quite likely, however, that the insect is not so rare as would appear, for it is very readily overlooked, and it is quite easy to attribute its work to some other cause. The present case was only reported to me after the attack was over, but the symptoms were unmistakable, and some of the beetles were still present.

The germinating mangold seed is attacked and much of the crop may be destroyed before showing above ground, while the seed leaves and stalks of the very young plants are also attacked. At a later stage they do not suffer much. The farmer had noticed that the soil where the crop failed was swarming with small insects, which were particularly numerous in pieces of

dry dung. This is the usual experience, and it is probably in farmyard manure that they were conveyed to the crop.

Onion Eelworm.—Writing of the eelworm, *Tylenchus devastatrix*, in her "Manual," Miss Ormerod says, "Onions suffer much from the infestation in Holland, but have not yet been reported as injured in this country." I have not come across such an attack till this year, and though I am informed that it is not new, I have not succeeded in finding any printed record of it. Two cases occurred, one in Lincolnshire and one in Norfolk, and the worm was very destructive.

The crops considered to be most liable to attack by *Tylenchus* are oats and clover. The onion eelworm did not appreciably differ in appearance, but to test its identity oats and clover were grown in flower pots, in soil contaminated by the diseased onions. The oat plants have developed marked "tulip root," but the clover is not yet affected, though it may be later on.

FRUIT PESTS.

All kinds of caterpillars attacking the leaves of fruit trees have been very abundant. Much harm has also been done by apple-sucker, and in some districts by capsid bugs. Some of the fruit-eating pests were also conspicuous, especially, perhaps, the codlin moth.

Before the season arrived, advice was asked with regard to a periodic attack of flies, said to be of the blue-bottle kind, on un-ripe plums, which on certain trees were annually destroyed before they were fit to pick. I was unable to give any opinion without seeing the insects, and in due time specimens were sent. They proved to be the common flesh-fly, *Lucilia caesar*. These flies are entirely reared on flesh—living or dead—and if they appear in extraordinary numbers it can only be because of the proximity of some such source as a slaughter-house, or many dead animals, such as sheep or rabbits, lying about. Their relation to fruit is precisely that of wasps, but I was not aware that they would eat other than ripe fruit. I had no proof of this in the present case, for the plum crop had failed, and the grapes on which they were found were quite sweet.

If no special source of such flies can be discovered and dealt with, there is nothing for it but to treat them as wasps. Large numbers would be caught by a plentiful supply of wasp-bottles.

A very rare pest occurred this year in the strawberry moth, *Acalla (Peronea) comariana*. It was first recorded in England by Miss Ormerod in 1883, from Cheshire, where, however, it appeared to have been established for some years. After this no one seems to have come across it till Theobald met with a case in 1911. On June 23, I was informed that many acres of strawberries in Lincolnshire were being destroyed by cater-

pillars, some of which were sent. From them moths were bred out, which were certainly *Acalla comariana*. This may have been the second brood, for the moths appear early in May, and the attacks, in the cases originally reported, began in that month. Miss Ormerod's correspondent informed her that young plants were never affected, two year old plants suffered moderately, but older plants were invariably ruined. From these facts she inferred that the moths did not fly far afield, but that having obtained a footing in any one crop they increased annually till the plants succumbed. She suggested skimming off the surface soil, with the idea of clearing off the chrysalids. In the present instance the strawberries were grubbed up and burnt while the insect was still in the caterpillar stage, and it was hoped that no large number had yet left the plants to pupate.

Another attack by this pest was notified from Norfolk.

The moth receives its name from the marsh cinquefoil, *Comarum*, which is one of its food plants. If this plant were common in the neighbourhood it might be a danger to the strawberries, but it only grows on boggy soil.

ANIMAL PARASITES.

Many of the applications received have had reference to parasitic diseases of animals. Some have been outside the scope of this department and have been referred to the Royal Veterinary College, but advice has been given in cases of bee disease, scabies in fowls, &c., and many specimens of ticks, lice, mites, and other external parasites have been received for determination.

One correspondent wrote to inquire the time which elapsed between infection and the appearance of pronounced symptoms in the disease of "gid" in sheep, as he hoped to be able to trace the origin of the disease in the case of sheep whose movements were known. Unfortunately, no satisfactory answer can be given, for the acuteness of the symptoms depends largely on the severity of the attack—on whether only one bladder-worm or several are present in the brain—and also, probably, on their situation. Symptoms may occur from eight to twenty days after the worm reaches the brain, but it is not till much later that they attain any considerable size. On the 24th day they are about the size of a pea.

WARBLE-FLY.

It is thirty-four years since Miss Ormerod issued her famous leaflet on Warble-fly. For years before this date she had deeply studied the pest and done most valuable work in collecting statistics with regard to its incidence and the destruction wrought by it, and her own contributions towards our knowledge of its

life-history were of great interest. Since 1888, a multitude of workers of many nationalities have attacked the subject, and by slow degrees the many puzzling problems it presented have been solved, and though, no doubt, there are still many things to be learnt about the warble-fly, we are at length able to trace its life-history with practical certainty. The two observers who have, perhaps, done most to settle the last disputed points are Professor Carpenter in Ireland, and Dr. Hadwen in British Columbia.

The later stages of the development of the fly were accurately described by Miss Ormerod, but she was mistaken about the process of egg-laying, and it is only quite recently that the

mystery, which has so long enveloped the early life of the grub, has been cleared up. The wanderings of the maggot within the animal, however remarkable, have no particular bearing on the practical measures to be taken against the pest, but the egg-laying is another matter, as all such measures as *preventive* smearing must, of course, depend upon it.

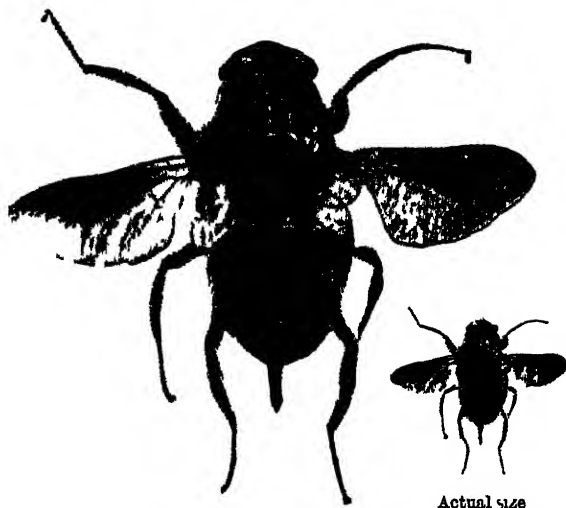


FIG 1—*Hypoderma bovis*, female, much magnified. Photo by N D F Pearce, from "Typical Flies" by E K Pearce

Now, the essential facts of the method of egg-laying and the consequent futility of smearing the backs of cattle to keep off the fly have been perfectly well known for many years, and in my Report for 1908 I tried to bring home to those interested the absolute conclusiveness of Professor Carpenter's Irish experiments. The facts as now known have obtained no acceptance among farmers. This is partly due to the prestige of Miss Ormerod's name, and partly to the fact that her account of the life-history of the warble-fly was extremely simple and easy to follow. Moreover, until lately, the farmer was always able to retort—"You say that Miss Ormerod was wrong in some of her statements about the life-history of the warble-fly, but you

admit that you do not fully understand its life-history yourself. Give us a plain account of it and then we may listen to you." Well, now we are in a position to meet this challenge. Unfortunately, the life-history is not at all simple; if it had been it would not have baffled us so long. To believe the old account simply because it was Miss Ormerod's, and because it was easy to understand, has now become rather like the schoolboy's famous definition of faith—"Faith is believing in what we know is not true."

Miss Ormerod's own views about the warble-fly were greatly modified before her death, but farmers take no account of this, but adhere firmly to the creed of the famous "Fly-leaf," which is briefly as follows:—

The Life-History according to Miss Ormerod's Fly-leaf.

Warble-flies lay eggs in the backs of cattle during the summer. The grubs live in the hide and set up irritation, on the products of which they live. In early spring the swellings on the back develop openings to the exterior into which the grub introduces its tail, which bears the breathing pores, and here it remains till it is "ripe," when it emerges and changes to a chrysalis, which presently gives rise to the fly. Therefore, there are two things to be done, namely, to destroy as many grubs as possible before they escape, and, by preventive smears, to warn off the fly from laying its eggs on the animals' backs during the hot weather.

Now the subsequent discovery which altogether upset this simple account of the matter was this—that the eggs are not laid in the hide but are attached to the animal's hairs, and that moreover *the region where the warbles appear is just precisely that region where the eggs are hardly ever laid, the favourite spots for their attachment being the legs, or the under side of the body.* If this is true, and it is corroborated by hundreds of observers, a new problem is presented—how does an egg laid on a hair of the leg give rise to a warble on the back? It is this problem which has taken so long to solve, and that it has proved a very tough one will hardly be wondered at by anyone who reads its solution and realises that the grub when it hatches out from the egg is a very minute creature, about one-thirtieth of an inch in length.

The Life-History as now known.

There are two ox warble-flies, known scientifically as *Hypoderma lineatum* and *H. bovis*. An exaggerated idea is current as to their size, perhaps because Miss Ormerod likened them to humble bees. They are nearer the size of a honey bee, but not so long in the body. *H. lineatum* is the smaller species, and it appears distinctly earlier in the season than *H. bovis*.

Both are common in England, but in Ireland *H. bovis* is prevalent, while the Canadian warble-fly is nearly always *H. lineatum*.

The flies appear in sunny weather "during the summer," but this is a very loose expression, and actual dates are important. In British Columbia, with a climate similar to that of England, Hadwen has caught specimens of *H. lineatum* in April, while in Ireland Carpenter has seen *H. bovis* attacking cattle in September. Thus months may elapse between the earliest attack of the one fly and the latest attack of the other, and the two species overlap, which accounts for the very different dates at which warble swellings make their first appearance in the back. Much depends on the weather of the particular season.

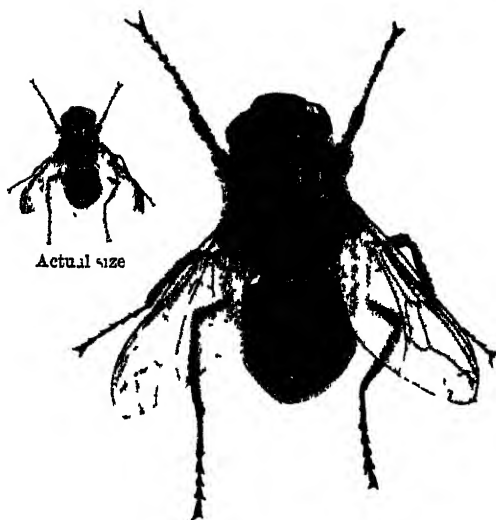


FIG. 2—*H. lineatum*, male, much magnified.
Photo by N D F Pearce from "Typical Flies,"
by E K. Pearce

The eggs are attached to the hairs of cattle. Yearling cattle are preferred, calves being the next choice, while older beasts attract the flies far less. The legs are attacked for the most part, though a few of the insects strike the lower part of the body. The two species differ in one respect—*H. bovis* attaches a single egg at the base of each hair, while *H. lineatum* will place many eggs in a series on a single hair.

If the cattle are standing and become aware of the fly they show much excitement and "gad." Hadwen has, however, seen *H. lineatum* lay eggs all along the side of an animal lying down, without the cow knowing anything about it. In this case the fly never alighted on the body at all, but ran backwards from the grass till it reached the hairs to which it attached the eggs.

On about the fourth day the egg hatches, and a tiny maggot climbs down the hair and makes its way into the hair follicle at its base. A few days later it has entirely disappeared. If the animal be slaughtered, no trace of a maggot is found in the

hide at the point of entry. It has disappeared from the hide at one spot to reappear at a totally different spot months hence. Where is it in the meantime?

We next meet with the grubs in the wall of the gullet, where specimens are to be found all through the autumn and winter. Apparently the microscopic grub which bored its way in has entered the blood stream, and been carried by it to this its next stopping place, as far as we know.

Maggots begin to appear in the gullet wall in September (or even August), and are found there throughout the autumn and winter months, being most numerous in November and December, and disappearing in March. There can be no doubt that the earliest maggots in the gullet come from the earliest laid eggs, and the latest gullet maggots from those laid latest. Indeed, there are three periods which precisely agree; the egg-laying may take place from May to September; maggots are found in the gullet from September to March, and in the back from November to May.

From the gullet they go to the back *through the tissues of the animal*. There may be various routes, but one has been definitely traced by Hadwen and Bruce.¹ According to this the maggots leave the gullet near its junction with the paunch and enter the connective tissue of the diaphragm, which they follow between the strands of muscle downwards and outwards till they reach the cartilage of the ribs. They then proceed along the posterior border of a rib—always in the connective tissue—and either go straight to the hide of the back in that region or find their way into the spinal canal, from which they can emerge again nearer the animal's tail.

When they leave the gullet they are about half an inch long, and any further growth takes place in their final position. Hides containing newly arrived warble grubs afford clear evidence that those grubs have entered not from above but from below.



FIG 3.—Eggs of *H. lineatum* attached to a hair, greatly magnified.
After Prof. Carpenter.

¹ Department of Agriculture, Canada, Bulletin No. 22, Ottawa, 1916.

The further history is perfectly well known by all agriculturists. Established in the hide, a cyst is formed round the grub, which now makes a hole to the exterior. In due time it becomes "ripe" and falls out of the warble to turn to a chrysalis in the ground. After a variable interval according to the weather, but averaging about five weeks, the fly appears.

The Practical Bearing of the New Facts.

In the life-history as now known there is, as we began by saying, one fact of paramount importance from a practical point of view—the fact that the eggs are not laid on the back, but chiefly on the legs. How, then, can a cow be saved from warbles by smearing its *back* with a preparation intended to

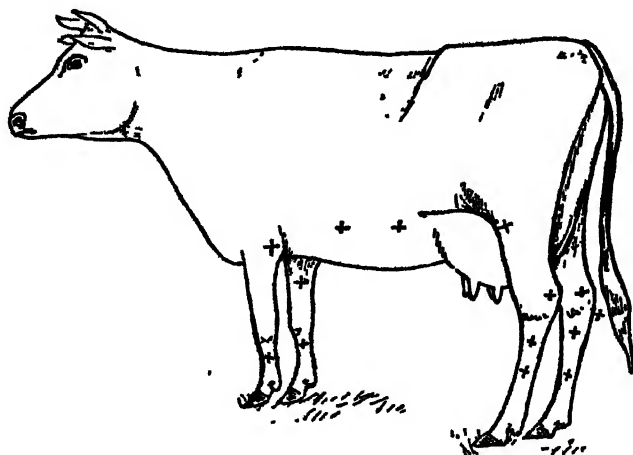


FIG. 4—Egg-laying of *H. lineatum*. The crosses mark the spots where the fly was seen to strike and the eggs were afterwards found. After Dr S. Hadwen

keep off the fly? Miss Ormerod said it could, and many farmers believe it to this day. Obviously there is only one way to settle the matter, namely, by experiment. Mere vague impressions are absolutely worthless. It is even of no account for a farmer to say that he smears his cattle, and they are free from warbles, unless he deliberately leaves some of the cattle unsmeared to see if they show any difference. Now Professor Carpenter has been experimenting for years, and his results are absolutely conclusive. During the three years 1904-1907 he experimented with 103 animals, keeping during the same time 68 animals, untreated but otherwise under the same conditions, as "controls," for the purpose of comparison.

Some were dressed on the back, some on the legs, some all over. Various dressings were used, including Miss Ormerod's tar and train oil smear, and on some of the animals the dressings were applied daily! And here is the result:—

	Dressed		Untreated	
	No. of Animals	Average No. of Warbles	No. of Animals	Average No. of Warbles
Calves	67	10	24	12
Yearlings . . .	28	24.5	11	27.6
Cows	8	8.7	33	3.3

Moreover, four calves whose backs throughout the season had been covered by a linen coat so that no fly could get at them nevertheless developed an average of ten warbles each. It is impossible to avoid the conclusion that for many years past money and labour has been expended in preventive measures which are absolutely without effect. Covering the legs, even for experimental purposes, is hardly practicable, for the coverings are so easily disarranged. Carpenter tried it with four calves, but it was noticed that parts of their legs were sometimes exposed. Their average of warbles was 3.5. Nobody, of course, would suggest covering except as an experiment. We now see that dressing, if used at all, ought properly to be applied to the legs and belly where the eggs are laid, and not to the back. Carpenter's experiments prove that it is not an effective preventive measure, however applied.

Treatment of Warbles.

If it were possible to kill all the warble grubs present at this moment in the bodies of the cattle in the United Kingdom there would be no flies next season to continue the attack. Realise that during the winter the insect does not exist outside the cattle, and the huge possibilities of a determined campaign against the grubs before they can turn to flies are apparent. Of course their complete extirpation is a counsel of perfection, but a great deal might be done. The compulsory treatment of warbled cattle might be at least as beneficial as the compulsory spraying of a mildewed gooseberry bush. The best plan undoubtedly is to squeeze out the warble grubs, and this can be done long before they are "ripe." It is also possible to kill the grubs within the warble by applying some ointment to its external opening. Unfortunately no preparation has yet been discovered which is fatal to the maggots and harmless to the

cattle. Carpenter has experimented with about forty different preparations. Most of them were useless for killing the maggots, and those which were effective either injured the skin or caused much pain to the animal. Until some compound more satisfactory is discovered we must strongly recommend the squeezing out of the maggots. For this to be effective the animals would have to be examined and treated fortnightly from the middle of February to the end of June; a very great labour no doubt, but not excessive in view of the tremendous results were it universally practised.

A Long-standing Controversy.

Years ago, when it was first established that the warble-fly eggs were for the most part laid on the hairs of the legs and that the grubs, before reaching the back, were first to be found in the wall of the gullet, there were two rival theories as to how they reached that position, and only persistent experiment and observation have settled the matter in the way described above. The theory which now has to be discarded was that when the eggs attached to the hairs hatched, the animals, licking themselves because of the irritation, carried off the minute maggots on their tongues and passed them into the gullet, into which they bored their way. This was a perfectly reasonable suggestion and even has an advantage in simplicity over what really happens, though such farmers as paid any attention to it received it with ridicule. To this day there is only negative evidence against it, though there is positive evidence in favour of the rival theory. It was to settle this point that Carpenter undertook his muzzling experiments which were designed to discover whether an animal which was prevented from licking itself throughout the season would nevertheless develop warbles. The difficulties of effective muzzling made the results unsatisfactory and conflicting, but when it was most thorough there seemed to be an increase rather than a decrease in the number of warbles. Another experiment tried by both Carpenter and Hadwen was to feed newly-hatched warble maggots to young calves with the view of testing whether the disease could be communicated in this way, but the attempt met with no success.

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THE WOBURN EXPERIMENTAL STATION OF THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

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[NOTE.—In order to meet the necessities of the times and to reduce the cost of paper, printing and transmission, the present Report is considerably curtailed, and mainly by the omission of details of cultivation, which, as a rule, are set out each year. Moreover, in the discussion of the results of experiments, only such points are dealt with as are new or which present special features. For fuller details applying to the experiments carried on continuously, reference is directed to reports of former years.]

FIELD EXPERIMENTS, 1916.

THE season of 1916 was one of exceptional and generally unfavourable character. After a winter marked by a good deal of rain and but little frost, a fine dry January followed. Then came an excessively wet February and March with heavy rain and snow. The summer was dull and cold, being

very unfavourable for the growth of corn, though grass thrived luxuriantly and a heavy hay crop resulted, which, as a rule, was got in in fair condition. A spell of fine weather in July helped the corn prospects considerably, but a good deal of rain in August caused delay in harvesting, and, altogether, the corn yields were disappointing throughout. Owing to the wet in early spring and the shortage of labour there was great difficulty in keeping the land clean, and root crops generally suffered greatly. Potatoes, too, which at one time promised well, quite disappointed expectations, though there was not a great loss through disease. Altogether, the season was one marked by failure of crops to come up to estimated yields, and this was especially the case with corn crops. The rainfall for the year reached 27.94 inches, and the wettest month was March, 4.91 inches of rain then falling, this being the highest recorded for that month for a century. In this month there were 125 hours of rain or snow; 24 out of the 31 days were wet, and on March 27 alone 1.02 inches of rain fell.

CONTINUOUS GROWING OF WHEAT (*STACKYARD FIELD*) 1916 (40TH SEASON).

The following are the dates of the principal operations :—

- 1915, Oct. 15—Farmyard manure applied to plot 11b,
5 tons 8 cwt. 3 qrs. 20 lb. per acre; contained
675 per cent. of nitrogen.
- „ Oct. 29—Wheat drilled, “Red Standard,” 10 pecks
per acre.
Mineral manures applied same day.
- 1916, May 1—Rape dust applied, 438 lb. per acre; con-
tained 4.70 per cent. of nitrogen.
- „ May 24 and June 15—Nitrogenous top-dressings
applied.
- „ Aug. 25—Wheat cut.
- „ Sept. 8—Wheat threshed in the field direct from
the “stook.”
- „ Sept. 18—Corn dressed and weighed.
- 1917, Jan. 15—Corn valued.

The harvest results are given in Table I., page 238.

The wheat crop was much below that of 1915, when 12.9 bushels of corn were produced on the unmanured plot, though it was not quite as bad as the very low yield of 1914. The untreated plots gave an average of 6.4 bushels per acre of corn with 6 cwt. $1\frac{1}{2}$ qrs. of straw.

Sulphate of ammonia used by itself was, as usual, an entire failure (plot 2a), but used along with lime continued to

yield crops in excess of the unmanured crop, though the lime had been last applied several years before. Thus, plot 2b (lime, 2 tons per acre, last given in 1897) showed 1·2 bushels increase; plot 2aa (lime 5 cwt. in each of four years 1905, 1909, 1910, 1911) 1·1 bushels increase; plot 5b (lime 1 ton, 1905 along with minerals) 7·5 bushels increase. The single application of 10 cwt. of lime in 1905 (plots 8aa, 8bb) had evidently proved insufficient, and, once more, the repetition, in 1905, of the 2 tons of lime first applied in 1897 (plot 2bb) did not prove as beneficial as the single dressing of 2 tons (plot 2b). The general practical conclusion that one would draw so far from this series is that, as regards the wheat crop, on land deficient in lime, sulphate of ammonia can be safely used if 1 ton of lime per acre be given, and that the lime will last for quite ten years; that 10 cwt. of lime per acre is insufficient, and 4 tons per acre too much. Further experiments conducted this season at the Pot-culture Station on this subject will be read with interest (see page 257).

Nitrate of soda generally did rather better than sulphate of ammonia supplying the same quantity of ammonia. Where, as in the case of plots 5b and 6, a fair comparison could be made, the nitrate gave $\frac{1}{2}$ bushel more corn and nearly 4 cwt. more straw per acre. Used by itself, 1 cwt. per acre of nitrate of soda gave (plot 3b)—in the 40th successive year of application—2 bushels more corn than the untreated plot, and 2 cwt. per acre of nitrate of soda gave 4·6 bushels more (plot 3a). The value of using mineral manures in addition to nitrate of soda is shown in plot 6 where the increase over no manure was 8 bushels, and that over nitrate of soda alone 6 bushels. The extra dressing of nitrate of soda (plot 9a) showed no added benefit. As between the inclusion of superphosphate or that of sulphate of potash in mixed mineral manures, a slight advantage followed the use of sulphate of potash (plots 10a, 11a).

Between the use of rape dust (plot 10b) and that of farmyard manure (plot 11b) there was not a great deal to choose; the farmyard manure, however, produced nearly 1 bushel more, giving the highest yield this year of all the plots, viz. 15·7 bushels of corn with 18 cwt. of straw per acre. Rape dust gave the second highest yield, and nitrate of soda with minerals (plot 6) came third.

Samples of the grain of the different yields were, as usual, submitted for valuation by Mr. T. Smith, Junr., of Bedford, but, for various reasons, the values assigned are not this year set against each separate plot. It will be recognised that at the time of valuation (January, 1917) altogether abnormal prices were ruling for grain, and what in an ordinary year

TABLE I.—*Continuous Growing of Wheat, 1916*
(40th Season).

(Wheat grown year after year on the same land, the manures being applied every year.)

Stackyard Field—Produce per acre.

Plot	Manures per acre	Head corn		Tail corn	Straw, chaff, &c.
		No. of bush.	Weight per bushel	Weight	
1	Unmanured	5.7	Lb. 54.0	Lb. 6	C. q. lb. 5 3 25
2a	Sulphate of ammonia (=25 lb. ammonia)	—	—	—	—
2aa	As 2a, with 5 cwt. lime, Jan., 1905, repeated 1909, 1910 and 1911.	7.5	55.6	16	7 1 10
2b	As 2a, with 2 tons lime, Dec., 1897.	7.6	53.3	12	6 1 13
2bb	As 2b, with 2 tons lime (repeated), Jan., 1905	6.4	52.0	16	7 2 2
3a	Nitrate of soda (=50 lb. ammonia)	11.0	50.5	18	15 0 27
3b	Nitrate of soda (=25 lb. ammonia)	8.4	50.5	16	10 3 25
4	Mineral manures (superphosphate, 3 cwt.; sulphate of potash, $\frac{1}{2}$ cwt.)	4.6	53.2	6	5 3 13
5a	Mineral manures and sulphate of ammonia (=25 lb. ammonia)	8.3	52.2	18	8 2 14
5b	As 5a, with 1 ton lime, Jan., 1905	14.0	55.5	18	11 2 13
6	Mineral manures and nitrate of soda (=25 lb. ammonia)	14.5	52.5	22	15 1 2
7	Unmanured	7.2	54.0	10	6 3 4
8a	Mineral manures and (in alternate years) sulphate of ammonia (=50 lb. ammonia)	—	—	—	—
8aa	As 8a, with 10 cwt. lime, Jan., 1905	9.5	48.5	16	11 3 22
8b	Mineral manures, sulphate of ammonia (=50 lb. ammonia) omitted (in alternate years)	—	—	—	—
8bb	As 8b, with 10 cwt. lime, Jan., 1905	3.8	52.0	8	6 0 5
9a	Mineral manures and (in alternate years) nitrate of soda (=50 lb. ammonia)	12.3	51.2	22	14 2 22
9b	Mineral manures, nitrate of soda (=50 lb. ammonia) omitted (in alternate years)	7.0	54.5	10	8 1 1
10a	Superphosphate 3 cwt., nitrate of soda (=25 lb. ammonia)	9.7	53.7	16	10 2 7
10b	Rape dust (=25 lb. ammonia)	14.8	55.5	20	14 2 21
11a	Sulphate of potash 1 cwt., nitrate of soda (=25 lb. ammonia)	10.1	51.7	20	10 2 24
11b	Farmyard manure (=100 lb. ammonia)	15.7	54.5	20	17 3 25

TABLE II.—Continuous Growing of Barley, 1916
(40th Season).

(Barley grown year after year on the same land, the manures being applied every year.)

Stackyard Field—Produce per acre.

Plot	Manures per acre	Head corn		Tall corn	Straw, chaff, &c.
		No. of bush.	Weight per bush.	Weight	
1	Unmanured	13.9	Lb. 48.6	Lb. 36	C. q. lb. 10 1 10
2a	Sulphate of ammonia (=25 lb. ammonia)	—	—	—	—
2aa	As 2a, with 5 cwt. lime, Mar., 1905, repeated 1909, 1910 and 1912	9.0	47.2	24	6 2 5
2b	As 2a, with 2 tons lime, Dec., 1897, repeated 1912	17.0	46.0	64	13 0 11
2bb	As 2a, with 2 tons lime, Dec., 1897, repeated Mar., 1905	22.6	47.5	52	14 0 20
3a	Nitrate of soda (=50 lb. ammonia)	24.0	47.1	81	20 0 17
3b	Nitrate of soda (=25 lb. ammonia)	18.6	46.2	65	13 3 21
4a	Mineral manures ¹	17.3	48.4	30	10 2 16
4b	As 4a, with 1 ton lime, 1915	17.0	48.9	38	12 0 20
5a	Mineral manures and sulphate of ammonia (=25 lb. ammonia)	7.5	48.3	28	10 3 21
5aa	As 5a, with 1 ton lime, Mar., 1905, repeated 1916	24.2	49.5	56	19 3 24
5b	As 5a, with 2 tons lime, Dec., 1897, repeated 1912	23.3	48.0	82	15 3 24
6	Mineral manures and nitrate of soda (=25 lb. ammonia)	26.4	48.0	51	18 2 13
7	Unmanured	10.4	48.0	26	7 3 6
8a	Mineral manures and (in alternate years) sulphate of ammonia (=50 lb. ammonia)	—	—	—	—
8aa	As 8a, with 2 tons lime, Dec., 1897, repeated 1912	24.7	48.7	72	17 0 6
8b	Mineral manures, sulphate of ammonia (=50 lb. ammonia) omitted (in alternate years)	—	—	—	—
8bb	As 8b, with 2 tons lime, Dec., 1897, repeated 1912	11.2	47.6	28	9 3 0
9a	Mineral manures and (in alternate years) nitrate of soda (=50 lb. ammonia)	31.9	47.5	103	25 2 22
9b	Mineral manures, nitrate of soda (=50 lb. ammonia) omitted (in alternate years)	18.2	48.7	34	13 0 15
10a	Superphosphate 3 cwt., nitrate of soda (=25 lb. ammonia)	27.9	47.0	76	20 0 16
10b	Rape dust (=25 lb. ammonia)	20.7	48.6	74	13 0 24
11a	Sulphate of potash 1 cwt., nitrate of soda (=25 lb. ammonia)	29.8	46.1	74	23 2 10
11b	Farmyard manure (=100 lb. ammonia)	32.9	49.2	74	25 1 8

¹ Superphosphate 3 cwt., sulphate of potash $\frac{1}{2}$ cwt.

might fetch comparatively little and not be good enough for milling, would, with existing high prices and scarcity, be sought after and have a practically fictitious value. Again, largely for these same reasons, the valuer found himself unable to discriminate closely between the several lots, but divided them up into groups. Thus, taking 79s. per quarter as the basis, he assigned a value of 75s. to such samples as were good enough for milling. This class comprised plots 1, 2aa, and 5a, these, however, being all very low yields. The others he grouped together, valuing them at from 72s. to 73s. per quarter as, under existing circumstances, being worth this for grinding purposes.

CONTINUOUS GROWING OF BARLEY (*STACKYARD FIELD*) 1916 (40TH SEASON).

The dates of the principal field operations were :—

- 1916, April 10—Farmyard manure applied (plot 11b), 6 tons 4 cwt. per acre ; contained nitrogen .593 per cent. Lime applied to plot 5aa.
- „ April 13—Barley drilled, “Chevalier,” 9 pecks per acre. Mineral manures sown same day.
- „ May 2—Rape dust applied (plot 10b), 438 lb. per acre ; contained nitrogen 4.70 per cent.
- „ May 25 and June 15—Nitrogenous top-dressings applied.
- „ August 26—Barley cut.
- „ September 8—Barley threshed in field, direct out of “stook.”
- „ September 19—Corn dressed and weighed.
- 1917, January 15—Corn valued.

The harvest results are given in Table II. page 239.

In contradistinction to the wheat, the barley crop was this year a better one than in 1915, when 10.1 bushels of corn were grown. The average of the unmanured plots was now 12.1 bushels of corn, with 9 cwt. of straw per acre.

Mineral manures alone gave about 5 bushels more (plot 4a), the further addition of lime (1 ton per acre in 1915) producing (plot 4b) no benefit.

Sulphate of ammonia without lime was, as before, useless, but with 2 tons of lime per acre (the last 1 ton of which had been recently applied) gave (plot 5aa) an increase of 12 bushels over the untreated produce, and increases of 5 bushels, 10.5 bushels, and 11.2 bushels, with 4 tons of lime (plots 2b, 2bb, and 5b), the lime here having been applied in earlier years. The use of 1 ton of lime only (plot 2aa) was insufficient to counteract the acidity of the soil, and the crop was reduced.

When double the amount of sulphate of ammonia was used along with minerals and with lime up to 4 tons per acre (plot 8aa) the increase was 12·6 bushels.

Nitrate of soda, as in the case of the wheat, gave higher returns than the same amount of nitrogen in the form of sulphate of ammonia. Even when used by itself, 1 cwt. per acre of nitrate of soda (plot 3b) applied successively for 40 years, gave an increase of 6·5 bushels of corn and 5 cwts. of straw per acre over the untreated produce, and when the dressing was increased to 2 cwt. per acre (plot 3a) a further 5·4 bushels of corn and 6 cwt. of straw were yielded. The addition of mineral manures (plot 6) to the 1 cwt. of nitrate of soda resulted in an extra 7·8 bushels of corn being produced, while the like addition to the 2 cwt. nitrate of soda dressing (plot 9a) gave an increase over the nitrate application alone of 7·9 bushels of corn and 5½ cwt. of straw. Accordingly, the principle of mineral and nitrogenous applications for corn has been fully borne out by these experiments, and it has been further shown (by comparison of the unmanured plot with plot 3b, of 3a with 3b, and 6 with 9a) that an increase of between 5 and 6 bushels per acre of corn with one of 5 cwt. to 7 cwt. of straw may be expected as the result of using 1 cwt. per acre of nitrate of soda.

As between the inclusion of sulphate of potash (plot 11a) or superphosphate (plot 10a) in a mineral manure dressing, an advantage of nearly two bushels of corn, with corresponding straw increase, resulted from using potash.

Farmyard manure, which in the case of the wheat crop was only very slightly superior to rape dust, did far better than rape dust with barley, producing 12·2 bushels more corn, and 12 cwt. more straw (plots 10b, 11b), the farmyard manure, as with the wheat, giving the highest produce of all the plots, viz., 32·9 bushels, with 25 cwt. of straw. The second best plot was 9a—nitrate of soda, 2 cwt., with mineral manures.

Looking at the results of liming this land, it is clear that on a soil like this, poor in lime, 1 ton per acre of lime, while sufficient for the deeper-rooted wheat plant, is not enough for the shallow-rooted barley, which doubtless is more affected by the acid character of the top soil produced by the continuous application of ammonia salts (compare plots 5aa and 5b); also that 4 tons per acre of lime, applied at intervals, is not too much for barley, whereas it proved excessive for wheat.

As bearing on matters of present practical importance in corn-growing, it has further been shown that the right dressing for corn is that of nitrogenous top-dressings along with mineral manures, and that from an application of 1 cwt. per acre of nitrate of soda (or sulphate of ammonia) an increase of from

5 to 6 bushels of corn and 6 cwt. of straw per acre may be expected to result.

For the same reasons as set out in the case of the Continuous Wheat, the grain from the several plots did not have individual values assigned to it, but was divided into two groups, the general basis of valuation being a market value, at the then time (January, 1917), of 74s. per quarter. The barley was considered thin, badly grown, and containing badly matured corns. Some of the better lots might have passed for porter malt, owing to present scarcity of barley; the others were only fit for grinding. In the better lots, which were valued at from 71s. to 72s. per quarter, were comprised the produce of plots 1, 4, 5b, 8aa, 9a, 9b, and 11b. The others were put at 68s. per quarter only.

ROTATION EXPERIMENTS.—THE UNEXHAUSTED MANURIAL VALUE OF CORN AND CAKE (*STACKYARD FIELD*).

Series C. 2nd Rotation. 1914, *Swedes, fed on by Sheep with Corn and Cake respectively*; 1915, *Barley*; 1916, *Green Crop*.

The land received early in November, 1915, a dressing of 2 tons per acre of lime (Buxton). This being the year for a green-crop (in place of clover) following barley, rape was drilled at the rate of 8 lb. per acre on June 13 and came up a fair, though somewhat uneven, plant. It was fed on the land by sheep, September 6—18. The land was subsequently ploughed and prepared for wheat.

Series D. 2nd Rotation. 1916, *Swedes to be fed on by Sheep with Corn and Cake respectively*.

The second rotation was now beginning, and accordingly swedes, following the wheat of 1915, were drilled, with 3 cwt. per acre of superphosphate, on June 10, a good plant being obtained. The land had previously received, early in November, 1915, a dressing of 2 tons per acre of lime (Buxton). The crop, though not large, was very even throughout, and blanks were very rare. The season was not a favourable one for a good crop, but rather over 12 tons per acre were grown, and these, after being pulled and weighed, were adjusted to 12 tons per acre for each of the two experimental plots, and fed on by sheep which received, in addition to the roots and some hay chaff, corn (oats) on the one plot and cake (linseed and cotton cake mixed) on the other.

The weights of the swedes on the two plots are given in Table III.

TABLE III.—*Rotation Experiment. Series D (Stackyard Field). Produce of Swedes, 1916, after Wheat.*

Plot		Weight of roots per acre			
		T	c	q	lb
1	Corn-fed plot .	11	4	1	0
2	Cake-fed plot	13	12	3	12

GREEN-MANURING EXPERIMENTS.

(a) *Stackyard Field. Series A.*

In 1916 wheat followed the green crops fed on the land by sheep. Wheat, "Red Standard," 9 pecks per acre, was drilled on October 27th, 1915, and came up well. By April, 1916, a difference was noticeable between the plots, the wheat grown after tares looking decidedly inferior to that coming after mustard or rape, between which there was little to choose, though later on the mustard plot looked the better. The wheat was cut on August 24, and threshed in the field on September 8. The results are given in Table IV.

TABLE IV.—*Green-Manuring Experiment (Stackyard Field). Produce of Wheat per acre, 1916—after Green Crops*

Plot	Manuring	Heard corn			T c	w. w. &c			Value of corn per quarter on basis of 78s
		Weight	Bush	Weight per bush					
		Lb.		Lb	Lb	O	q	lb	s
1	Tares fed on	490	5 1	60.5	30	9	0	6	76 0
2	Rape fed on	617	10 2	60.2	36	9	3	0	78 0
3	Mustard fed on	684	11 3	60.5	48	10	2	17	78 0

The crops were disappointingly small, and considerably below those of 1914, but just as in that year the wheat after tares was the poorest crop, so it was again in 1916. Mustard, as appeared likely during the time of growth, proved 1 bushel per acre better than rape. It is significant that in this experiment, which has been in progress since 1911, of the three years' corn crops so far taken, in each case the wheat after tares has been inferior to the others, a like result to that so generally obtained in the earlier series in Lansome Field, where, however, the green crops are ploughed-in and not, as in Stackyard Field, fed on the land.

The valuer reported the samples to be well grown, for the season, and much superior to the wheat of the continuous wheat

series. They were well matured and in good condition, and exhibited little difference between the several lots, that from plot 3 (mustard) being, if anything, the best, and showing more bloom, and being the most level.

(b) *Lansome Field.*

This being the year of green crops, tares were drilled on April 29, 1916, and rape and mustard on June 2. The tares did not do very well, and the rape also grew but slowly; the mustard, however, grew well. The first crops were ploughed in on July 18, and second crops sown. They all appeared, but, the season being unfavourable, they did not come to much, and at the end of September the land was ploughed deep for wheat.

INFLUENCE OF MAGNESIA ON WHEAT.

(WARREN FIELD).

This experiment, in continuation of earlier ones on other fields of the farm, was in 1916 carried out on Warren Field. The soil here is heavier than on any other field on the farm, and analysis showed it to contain in the first 6 inches: Lime (CaO) .35 per cent., Magnesia (MgO) .41 per cent. In consequence of the already considerable amount of magnesia in the soil the further addition was made at the rate of 2 tons per acre only, and not 4 tons as usual. In addition to the magnesia plot, and the untreated one, a third plot was set out, on which lime at the rate of 2 tons per acre was used.

The consequence of adding magnesia and lime severally to the two plots was to leave the respective percentages as follows:—

Plot		Lime per cent	Magnesia per cent
Plot 1	Magnesia plot . . .	.36	.60
" 2.	Untreated " . . .	.35	.41
" 3.	Lime " . . .	.55	.41

Each plot was $\frac{1}{10}$ acre in extent. As the field was to be partly in winter wheat and partly in spring wheat it was decided to make the experiment with each crop. The winter wheat was sown on November 21, 1915, the magnesia and lime (both finely ground) being spread the day before. The spring wheat ("Red Marvel") was drilled on April 6, 1916, the magnesia and lime dressings having been applied in the previous February. The wheat grew well, and, as the results show, a capital crop resulted, this in one case exceeding 38 bushels per acre. The magnesia plot presented the usual features that have been associated with the use of magnesia in these experiments—the darker colour of the stalk, and the greater tillering. The lime plot, on the other hand, looked inferior to the untreated. The winter wheat was cut on

August 22-23, carted September 5-6, threshed December 2. The spring wheat was cut on September 11, carted September 15, threshed December 3, and dressed December 13. The results are given in Table V.

TABLE V.—*Magnesia on Wheat, 1916 (Warren Field).*

Produce per acre

Plot	Treatment	Head corn			Tail corn	Straw, chaff, &c	Value of corn per quarter on basis of 79s	
		Weight	Bush	Weight per bushel	Weight			
	(a) <i>Winter Wheat</i> —	Lb		Lb	Lb	C. q lb	s.	d
1	Magnesia, 2 tons per acre	2,365	38 6	61 2	10	33 3 20	79	0
2	Untreated	2 245	36 6	61 2	10	32 2 15	78	6
3	Lime, 2 tons per acre	2,050	33 3	61 5	10	25 3 16	78	6
	(b) <i>Spring Wheat</i> —							
1	Magnesia, 2 tons per acre	1,755	29 2	60 0	7	21 1 20	78	0
2	Untreated	1,600	27 1	59 0	10	21 0 13	77	0
3	Lime, 2 tons per acre	1,415	24 0	59 0	7	17 2 20	77	0

In both cases the results point in the same direction, viz. that the magnesia has produced about 2 bushels per acre more corn than the untreated plot, and that the direct application of lime has, in the first year, resulted in a reduction of about 3 bushels per acre. This latter effect has been noted before in the first year of the application of lime to wheat, and may be due to causticity, which, however, would not seem to be exercised in the case of the magnesia.

The grain was valued, and Mr. Smith reported in regard to the winter wheat that the corn of plot 1 (magnesia) was a very fine lot for the year, well grown and with plenty of bloom. It would fetch top price in any market. The other two lots, while good, had not quite the strength and bloom of plot 1 and contained a few weak corns.

As to the spring wheats, he considered them fairly well grown for the class of wheat ("Red Marvel"), but containing a good deal of offal corn. Here again plot 1 (magnesia) was the best.

Determinations of nitrogen were also made in the several lots and gave results as follows:—

	Winter Wheat Percentage of nitrogen	Spring Wheat Percentage of nitrogen
Plot 1 (magnesia)	1 90	1 77
" 2 (untreated)	1 74	1 65
" 3 (lime)	1 80	1 77

It will thus be seen that the addition of magnesia gave not only an increase in the crop yield, but that the quality of the grain was rather better and it was higher in nitrogen.

"HUMOGEN."—FIELD EXPERIMENT WITH BARLEY.

A field experiment on "humogen" (bacterised peat) had been carried out in 1915 on oats, without, however, giving any definite result. It was proposed, therefore, to continue the inquiry in 1916, using a barley crop grown in Butt Furlong. "Humogen" was spread at the rate of 10 cwt. per acre, and on another plot there was spread farmyard manure to give the same amount per acre of nitrogen as was contained in "humogen"; this amounted to $25\frac{1}{2}$ cwt. per acre; a third plot was left untreated. Each plot was further duplicated.

The barley had been sown on April 15, 1916, and six plots $\frac{1}{2}$ acre each were marked out, the farmyard manure being applied on April 14 and the "humogen" on May 10. The "humogen" was found, on analysis, to contain .57 per cent. of nitrogen only, this being very different to the preparation used in the experiments of 1915 when the "humogen" used contained 1.49 per cent. of nitrogen. The barley grew well, but, all through, the farmyard manure plots were the best, the "humogen" apparently showing no benefit. The crop was cut September 2-4 and carted September 7-9. It was threshed December 2, dressed and weighed December 12.

The results are set out in Table VI., the average of the duplicate plots being given. The duplicates in the case of the farmyard manure and the "humogen" plots were in near agreement.

**TABLE VI.—Experiment with "Humogen" on Barley, 1916
(Butt Furlong).**

Plot	Treatment per acre	Head corn			Tail corn	Straw, chaff, &c			Value of corn per quarter on basis of 79s.
		Weight	Bush.	Weight per bushel	Weight				
		Lb.		Lb.	Lb.	c	q	lb.	s. d.
1	Farmyard manure = 10 cwt "humogen" .	2 220	41 8	53.1	216	25	1	6	70 9
2	No treatment .	1,725	32.2	53 5	112	19	1	11	71 6
3	"Humogen" 10 cwts. .	1,850	34 7	53 2	172	22	1	18	70 9

It will be seen that the "humogen" did but little good, and was considerably inferior to farmyard manure supplying

a similar amount of nitrogen. It must be admitted, however, that the "humogen" used this season, although it was sent direct by Prof. Bottomley's orders, was certainly not of the same make and quality as that which was tried before. It is not for me to attempt to reconcile these differences, but I can hardly avoid the conclusion that the material sent out was not the proper preparation. So long, however, as there is this uncertainty as to the material being properly prepared, there can be no reliance placed upon it.

CLOVER AND GRASS MIXTURES.

Series B. Stackyard Field, 1916.

It may be remembered that in 1912 two plots of temporary pasture were laid down in Stackyard Field in a barley crop. The only difference between the two seedings was that in one mixture 4 lb. of "ordinary" white clover per acre were included, and in the other mixture these were replaced by 4 lb. of "wild" white clover per acre.¹ The plots had been hayed in each of the years 1913, 1914, and 1915, two crops being taken each year. The results for 1916 are given in Table VII., while in Table VIII. are given the totals for all four years, the experiment being now brought to an end, and the land ploughed and put in winter oats.

TABLE VII.

Plot	Seeding	Weight of hay per acre, 1916											
		1st crop				2nd crop			Total				
		T.	c	q	lb	T.	c	q.	lb.	T.	c	q.	lb.
1	Mixture with "wild" white clover	2	5	1	11	12	2	21		2	18	0	7
2	Mixture with "ordinary" white clover	1	12	2	18	9	2	0		2	2	0	18

TABLE VIII.—*Clover and Grass Mixtures (Stackyard Field).*

Total weight of hay crops for 4 years, 1913-16.

Plot	Seeding	Total Weight of Hay per acre			
		T.	c.	q.	lb.
1	Mixture with "wild" white clover	10	2	0	4
2	" " "ordinary" " "	9	0	2	28

¹ The special seeding was: Perennial rye grass, 12 lb.; cocksfoot, 10 lb.; timothy, 4 lb.; English red clover 4 lb.; white clover (ordinary or "wild"), 4 lb. per acre. The mixture with the "wild" white clover cost 9s. per acre more than the other.

For the first two seasons the "ordinary" white gave slightly more hay, but in the third season the "wild" white had the advantage, and still more so in the fourth, the main feature of difference being the heavier second crop with the "wild" white. In the field this was clearly noticeable, even from a distance, but still more marked was the difference in the aftermath, the smaller leaf and more creeping habit of the "wild" white clover being strongly marked.

Further, there could be no doubt after the removal of the second hay crop in 1916 that the "wild" white plot was considerably the better. Whereas the "ordinary" white clover plot had begun to get patchy, the "wild" white plot was strong and luxuriant, the clover covering the ground like a regular carpet, and this plot could well have been kept down longer.

Altogether, this experiment bears out the experience gained in the North of England as to the value of the inclusion of "wild" white clover in a grass mixture that is to be kept down for more than two years.

The experiment being now concluded, the plots were ploughed up, and winter oats were sown. The produce of each plot will be kept separate in order to see whether there is any difference in the corn crop following. Meantime samples of the soil were taken, and determinations were made of the organic matter and nitrogen in each. These were as follows :—

Percentage of	"Wild" white clover mixture		"Ordinary" white clover mixture	
	Oct. 9, 1916	Jan. 6, 1917	Oct. 9, 1916	Jan. 6, 1917
Organic matter	3.51	3.53	3.37	3.35
Nitrogen . . . . .	.116	.114	.110	.108

VARIETIES OF LUCERNE.

(a) *Large Plots.* (*Stackyard Field.*)

It had been intended to carry on this experiment, commenced in 1911, for another year before ploughing up the ground. But the season turned out so unfavourably that the lucerne hay could not be properly saved off the few plots that still bore any crop, and the experiment was brought to an end. The Canadian and the Provence varieties were the only ones to give a weighable crop in 1916. Table IX. gives a summary of the crops of hay taken since the commencement.

Decidedly the best of all the varieties was the Russian (Europe), it giving in each season the highest yield of hay. The Canadian variety held second place for a time, but eventually yielded it to the Provence. The North American variety also improved towards the close. Out and out the worst was the Turkestan variety, the plant dying out some time before the others. It may be remembered that, with the object of seeing which was the better way of laying down a lucerne crop, one

half of each plot was sown down in a corn crop (barley), and the other half sown bare. Just at the commencement of the experiment there seemed to be some advantage in sowing without a crop, but this soon disappeared, and no clear distinction could in the long run be drawn between the two methods, though, on the whole, sowing without a covering crop did the better.

TABLE IX.—*Varieties of Lucerne (Stackyard Field).*

Total produce of Hay per acre in the 4 years, 1912-15

Variety	Sown under a corn crop				Sown bare			
	r	c	q	lb	T	c	q	lb
American (Arizona)	7	1	3	10	6	16	0	18
Canadian	11	2	1	12	11	15	0	24
Turkestan	3	12	0	13	3	19	0	14
Provence	12	1	3	8	12	16	0	1
Russian (Europe)	14	2	2	4	14	11	1	23
Russian (Asia)	9	12	1	5	10	9	3	2
North American	10	17	1	20	11	4	2	10

(b) Small plots.

Small plots of three other varieties of lucerne grown in America, and noted for their hardiness, were also sown in 1915 on Stackyard Field. The weights of hay per plot (2 crops) in 1916 were:—

- | | |
|------------------------------|--------|
| 1. Sterling's "Montana" | 67½ lb |
| 2. Sterling's "North Dakota" | 85 lb. |
| 3. Grimm's Alfalfa | 91 lb |

GRASS EXPERIMENTS.

1. *Broad Mead*, 1916.

(a) Improvement of Old Pasture.

(b) Varieties of Lime.

(c) Different Forms of Lime.

Although Broad Mead had been hayed in 1915, and would in the ordinary course have been grazed in 1916, yet, on account of the dearth of stock, it was decided to again hay it. Accordingly, a further set of results is available, as well as those of Professor Biffen's botanical examination of the herbage.

The results are set out in Tables X. (Old Pasture), XI. (Varieties of Lime), XII. (Forms of Lime). As regards these it may suffice to say generally that the hay crops were large for the land, and the differences resulting from difference of treatment not so marked as usual. Thus, as regards (a) (Table X.) the dung plot alone showed any increase of hay over the untreated land, and that one of very doubtful value, as shown by Professor Biffen's analysis.

TABLE X.—*Improvement of Old Pasture (Broad Mead).*

Produce of Hay per acre, with Botanical Results, 1916.

Plot	Manuring per acre in 1913	Weight of hay per acre	Percentage of		
			Grasses	Legumi- noses	Weeds
1	Basic slag 10 cwt.	T. c. q. lb 1 18 0 0	96	3	1
2	Nitrate of potash 1 cwt.				
2	Mineral superphosphate 5 cwt.	1 17 2 0	95	3	2
3	Sulphate of potash 1 cwt.				
3	Basic slag 10 cwt.	1 18 2 0	93	6	1
4	Sulphate of potash 1 cwt.				
4	No manure	1 18 1 0	92	4	4
5	Lime followed (in 1913) by --				
5	Superphosphate 3 cwt.	1 13 3 0	93	6	1
6	Sulphate of potash 1 cwt.				
6	Dung 12 tons	2 6 1 0	92	3	5

TABLE XI.—*Varieties of Lime on Grass Land (Broad Mead).*

Produce of Hay per acre, 1916.

Plot	Lime applied in 1910 and again in 1913 ¹	Weight of hay per acre			
		T.	c.	q.	lb.
1	Buxton lime	1	18	1	0
2	Chalk lime	2	1	2	0
3	Magnesian lime	2	8	1	0
4	No lime	2	1	2	0
5	Lias lime	1	15	3	0
6	Oolite lime	2	1	2	0

¹ Two tons per acre in each caseTABLE XII.—*Different Forms of Lime on Grass Land (Broad Mead).*

Weights of Hay per acre, in 1916.

Plot	Lime applied, 1913 ¹	Weight of hay per acre			
		T.	c.	q.	lb.
1	Lump lime	1	19	1	0
2	Ground lime	2	1	2	0
3	Nothing	1	13	1	0
4	Ground limestone	2	1	2	0
5	Ground chalk	1	19	3	0

¹ 20s per acre (independently of carriage, cartage, &c.), was spent on each plot for the lime used.

The proportion of leguminous herbage did not turn out to be as high as was expected from the appearance of the plots during growth. But the main features are much as recorded

in 1913 and again in 1915. Thus, plots 3 and 5, on both of which sulphate of potash had been used, gave the most leguminosæ, and also the least amount of weed. The most weed was on the farmyard plot and on the unmanured one. Professor Biffen remarks on the small amount of cocksfoot shown, while sweet vernal grass was abundant, especially on plot 2. There was, speaking generally, more bottom herbage than usual, and the grasses on plot 6 (dung) were more vigorous and woody than on any other plot.

In (b) (Table XI.) the several applications of lime were renewed as recently as February, 1916, and, in view of this, it will be well to postpone discussion.

With (c) (Table XII.) no further dressings were given, and the results come out very satisfactorily as showing an increase (over the untreated plot) wherever lime had been employed, though, as between the different forms of lime, there is little to choose as yet.

2. *Charity Farm. Westbrook Field, 1916.*

Of the three experimental portions into which this field is divided, one only, viz. plot 1 (always hayed) was cut in 1916. The produce of hay on this plot was : 2 ton 7 cwt. 0 qr. 14 lb. per acre.

RAINFALL AT WOBURN EXPERIMENTAL STATION, 1916.

(292 ft. above sea level.)

	Total Inches	No of days with 0.1 in or more recorded		Total Inches	No of days with 0.1 in or more recorded
1915.			March . .	1.91	24
October . .	1.55	12	April . .	1.00	11
November . .	2.53	12	May . .	1.82	16
December . .	4.17	25	June . .	2.82	17
1916.			July . .	1.67	11
January . .	1.06	15	August . .	2.25	14
February . .	3.45	22	September . .	0.71	10
			Total . .	27.94	189

POT-CULTURE EXPERIMENTS, 1916.

I. *The Hills' Experiments—The influence of Radio-active Ore on Wheat.*

The question as to whether radio-activity plays any part in the growth of plants has been of late considerably debated, and although statements have been made as to the value of radio-active materials in the soil, based mainly on the results of

experiments conducted in America, the work done so far in this country has not borne out the expectation. An extensive series of trials carried out at Reading by Mr. H. F. Sutton produced negative or contradictory results. It seemed fitting, therefore, in continuation of the work done under the Hills' Bequest, on the influence of "rare elements," that the investigation might be pursued at Woburn. Through the kindness of a firm concerned in the export of radium ores from Portugal, a quantity of one of these ores, very finely ground, was obtained and was used in these experiments. The ore was stated to be ground radio-active natural ore, and to contain .15 per cent. of Uranium Oxide (U_3O_8).

As little was known about the material, it was determined to try it in quantities equivalent to 5 cwt, 10 cwt and 1 ton respectively per acre, and on a wheat crop. The experiments were in duplicate, there being also two untreated pots. Each pot containing 40 lb. of soil, the ore was used intimately mixed with the top 20 lb. of soil. The wheat was spring wheat ("Red Marvel") and sown on March 30, 1916. There was nothing to be noted in regard to germination, the several lots and the untreated all doing much about the same. Nor can it be said that during the period of growth there was anything particular to note beyond that the untreated set looked quite as well as any of the others. The measurements of ear and straw were taken as usual and the crop harvested on August 29.

Table XIII. gives the main results :—

TABLE XIII.—*Radio-active ore on Wheat, 1916.*

	Average length of ear	Average length of straw	Percentage weight	
			Corn	Straw
No treatment	inches 2 77	inches 23 11	100	100
Radio-active ore, 5 cwt per acre	2 55	24 76	92 5	93 1
" 10 " "	2 45	22 17	91 6	91 3
" 1 ton "	2 15	22 61	93 2	92 1

It would not appear therefore, from this experiment, that there was any advantage whatever accruing in the case of wheat from the application of the ore.

II. *Experiments on "humogen" (bacterised peat).*

In continuation of the series of experiments already reported (see reports for 1913 and 1914) the inquiry was renewed, a fresh supply of "humogen" being obtained from Prof. Bottomley. This was, however, very late in coming, and

when it did arrive it was found to be of very different quality to what had been previously employed. Analysis of it gave :—

Moisture	68.15
¹ Organic matter	33.75
Mineral matter	3.10
	<hr/> 100.00
¹ Containing nitrogen (total) . . . . .	.57
" " soluble in water . . . . .	.12
" " as salts of ammonia . . . . .	.05

Seeing that the material employed in the 1915 experiments contained about $1\frac{1}{2}$ per cent. of nitrogen, this new lot was evidently of inferior quality. The crops experimented on were barley, beans and mustard; but, as the "humogen" did not arrive until early in May, the crops could not be sown until May 31, and the barley never properly ripened, so that this crop is left out of account. It was decided, while using the "humogen," to compare with it ordinary peat giving approximately the same bulk as did the "humogen" and making up the lacking nitrogen in the peat by the addition of nitrate of soda, so that, as far as possible, the same bulk of manure and the same amount of nitrogen might be employed in the two cases. In this way, it was hoped, any differences due to mechanical action might be neutralised. Further, the comparison was extended to nitrate of soda alone, supplying as much nitrogen as the "humogen." The peat used contained water 14.7 per cent., nitrogen (total) .91 per cent., and it was then moistened with sufficient water to bring it up to the same water content as the "humogen" used. The comparative amounts of each material used were :—
(a) "humogen" 2 tons per acre, (b) peat 1.18 tons with nitrate of soda .71 cwt. per acre, (c) nitrate of soda alone 1.33 cwt. per acre. Each trial was in duplicate.

(a) Beans.

The seed was sown early in June, 1916, and came up well. After this the plants were thinned to six per pot. In the earlier stages of growth all the treated lots seemed better than the untreated. Pods began to form about the middle of August, but the late sowing, combined with the cold wet period of growth, prevented the proper maturing of the crop, and ultimately the plants had to be cut green and only the amounts of dry matter could be estimated. These were relatively :—

	Dry matter
Untreated	100
"Humogen"	106.3
Peat and nitrate of soda	103.2
Nitrate of soda alone	113.6

(b) *Mustard.*

Mustard was sown on May 31, 1916. In the early stages few differences were observable, but then the nitrate of soda lot began to show an improvement. This continued until July 28 when, the crop being in full flower, it was cut and weighed. A second crop was at once sown, and this in turn was cut and weighed on October 16. The results are given in Table XIV.

TABLE XIV.—“*Humogen*,” *Peat*, and *Nitrate of Soda* on *Mustard*, 1916.

	Dry weight			Percentage of untreated (total crop)
	1st Crop	2nd Crop	Total	
	Grammes	Grammes	Grammes	
Untreated	27·65	14·04	41·69	100
“ <i>Humogen</i> ”	26 12	13 55	39·67	95·2
Peat and Nitrate of Soda	29 82	12 91	42·73	102·5
Nitrate of Soda alone	34·51	14·61	49·12	117·9

The only treatment, it will be seen, to produce any benefit was that with nitrate of soda alone; the gain with peat was immaterial, and the “*humogen*” produced no increase at all. The quantity of nitrate of soda used was, of course, very small, owing to the poverty of the “*humogen*” in nitrogen, but it is clearly brought out from the above, together with the experiment on beans, that nitrogen supplied in an active form like nitrate of soda has been more effective than the same amount of nitrogen supplied in the less active forms of “*humogen*” and peat. Nor can it be maintained, so far at least as concerns the “*humogen*” here used, that there has been any increase of nitrogen formation in the soil.

III. *Experiments on “Nitrolim” and Dicyandiamide.*

It has been urged against the ordinary “*nitrolim*” (calcium cyanamide) that, when mixed with other materials, it is apt to “heat” and to give off a strong and objectionable smell, and that there is a tendency for the mass to “clog” together. To avoid this, a preparation of it in another form and sold as “*granular nitrolim*” was put on the market; this, while not quite so rich in nitrogen, avoided the difficulties referred to. The question arose whether, nitrogen for nitrogen, the “*granular nitrolim*” was as good as the ordinary.

A further question arose as to whether when, as sometimes happens, a polymeric body, known as “*dicyandiamide*,” is present, any ill effect is produced on plant life. It has been

maintained in some quarters that this body is poisonous to plants, and the immediate occasion of the trial now made was the rejection of a cargo of "granular nitrolim" on the ground of its containing dicyandiamide. This was done on the authority of the State laboratory at Rotterdam. It led me to examine a number of samples of commercial nitrolim, and in these I found dicyandiamide to be present in amounts varying from a trace only to 6 and 7 per cent. of nitrogen in this form. In a sample from the particular cargo complained of, 70 per cent. of the total nitrogen was present in the form of dicyandiamide. I endeavoured to procure some pure dicyandiamide to experiment with directly, but this was not procurable in the pure state, the nearest approach to it being a material 96·5 per cent. pure. The experiment was carried out with this, with ordinary nitrolim, and with the granular "nitrolim" complained of, and which, as stated, contained 70 per cent. of its nitrogen as dicyandiamide. The three lots severally contained:—

Ordinary nitrolim .	17 90 per cent of nitrogen
Granular " . . .	14 58 " "
Dicyandiamide .	64·20 " "

The two former were used in the respective quantities of 1 cwt. and 2 cwt. each per acre, while the dicyandiamide was put on in quantity to supply as much nitrogen as was contained in 1 cwt. and 2 cwt. of the granular nitrolim.

The crop experimented on was wheat, and the applications were made in three different ways—(a) a month before sowing of the wheat, so as to allow any possible early, harmful effects to pass away, (b) at the time of sowing, (c) as a top-dressing. Owing partly to the late arrival of the dicyandiamide, the entire series with it, and also the top-dressing experiments with all three materials had to be carried out on spring wheat, the others being with winter-sown wheat, so that the figures as regards actual yields are not strictly comparable. It will be sufficient, however, to record generally the observations made and the results obtained. All the trials were made in duplicate.

The materials were, with the exception of the top-dressing, mixed with the top 4 lb. of soil (40 lb. soil per pot). The top-dressings were given when the wheat plants were six weeks old.

Notes were made of the germination, but there was no difference of any account between application before sowing of wheat and at the time of sowing, nor between any of the three materials used, and it can be safely said that there was in no case any evidence of any harmful effect on the germination of the plant, not even with the dicyandiamide used alone.

During the period of growth the ordinary nitrolim in the earlier stages seemed decidedly superior to the granular, but, as harvest approached, these differences became less marked. The dicyandiamide, being only used on spring wheat, was not strictly comparable except as regards the top-dressing series, but, speaking generally, it was inferior to the other two.

The results are given in Table XV.

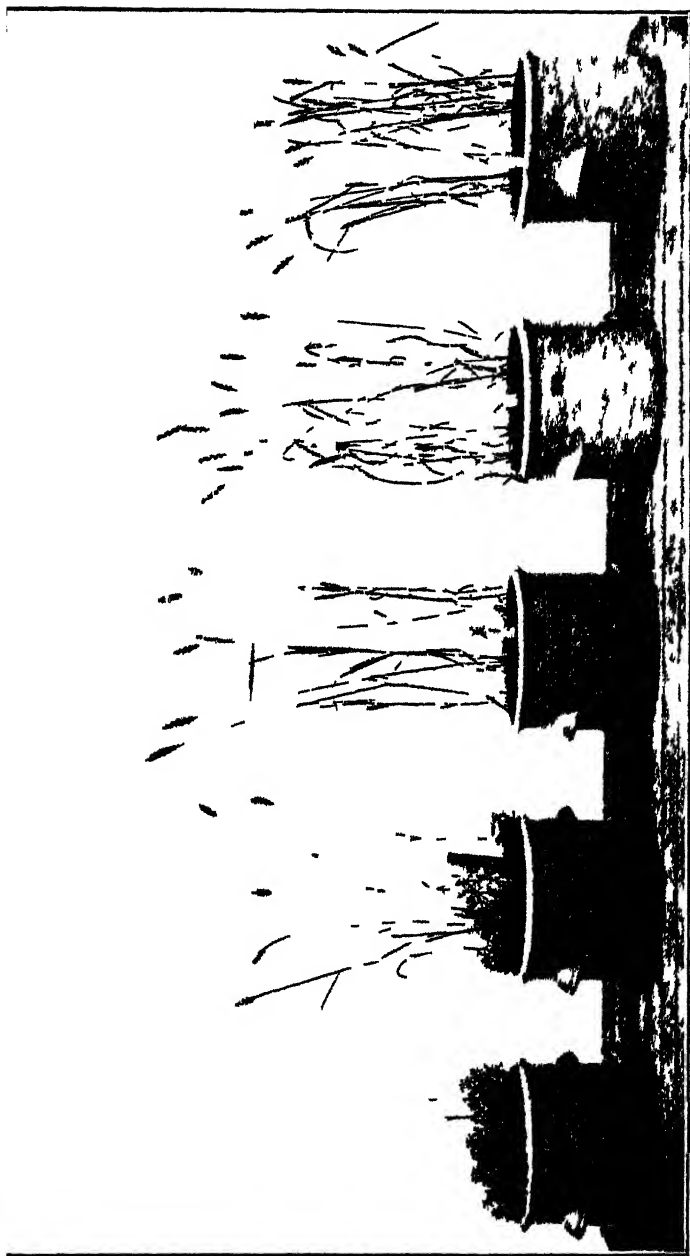
TABLE XV.—*Ordinary and Granular Nitrolim and Dicyandiamide on Wheat. 1916.*

	Applied before sowing		Applied at sowing		As Top-dressing	
	Corn	Straw	Corn	Straw	Corn	Straw
Untreated	100	100	100	100	100	100
Ordinary } 1 cwt. per acre . .	101.1	107.5	108.9	112.9	117.3	119.9
Nitrolim } 2 " "	110.0	102.7	122.4	123.9	131.7	138.2
Granular } 1 " "	106.8	101.8	102.2	97.4	117.3	117.1
Nitrolim } 2 " "	102.6	103.5	121.9	102.9	104.5	103.3
Dicyandiamide=1 cwt. gran. nitrolim per acre	91.1	98.3	95.4	94.4	104.9	93.5
Dicyandiamide=2 cwt. gran. nitrolim per acre	86.3	94.7	107.2	102.1	85.7	98.8

An examination of these results will show that the ordinary nitrolim did better, on the whole, than the granular nitrolim, and that both were somewhat superior to the dicyandiamide.

The differences were shown more in the top-dressings than in the earlier applications. With the dicyandiamide used alone there was a slight falling off, indicative of the fact that this material may have a slightly injurious effect, though nothing of the nature or extent alleged, and it could not be said that its presence in the granular nitrolim materially affected this, so far at least as the wheat crop is concerned. Nor was there, as already observed, any harmful effect on germination or any direct injury of the plant at any period of its growth. The most that can be said is that the less extent to which dicyandiamide is present the better. A further point brought out is that with all three materials the best results were obtained by top-dressing.

I have referred to the literature on the subject and to other experimental work done, and find there to be considerable uncertainty and difference of opinion as to the harmful effect or otherwise of dicyandiamide. It is stated, for instance, that it is injurious to mustard but not to cereals. I can only say that I am not at all satisfied with the evidence put forward as to the injury done by it, and, as a corn crop is that for which



e

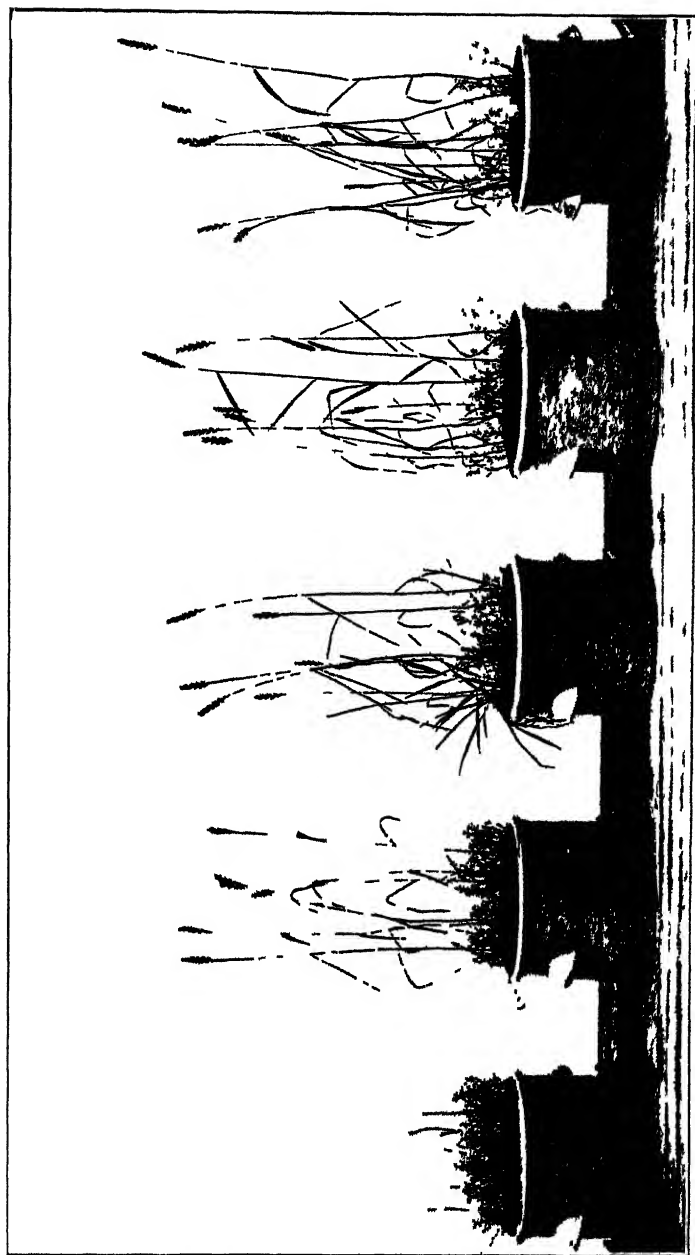
d

c

b

a

FIGURE 1.—Lime (CaO) added to an acid soil 1916
(a) untreated, (b) Lime, 1 ton per acre, (c) 2 tons per acre, (d) 3 tons per acre (e) 4 tons per acre



a

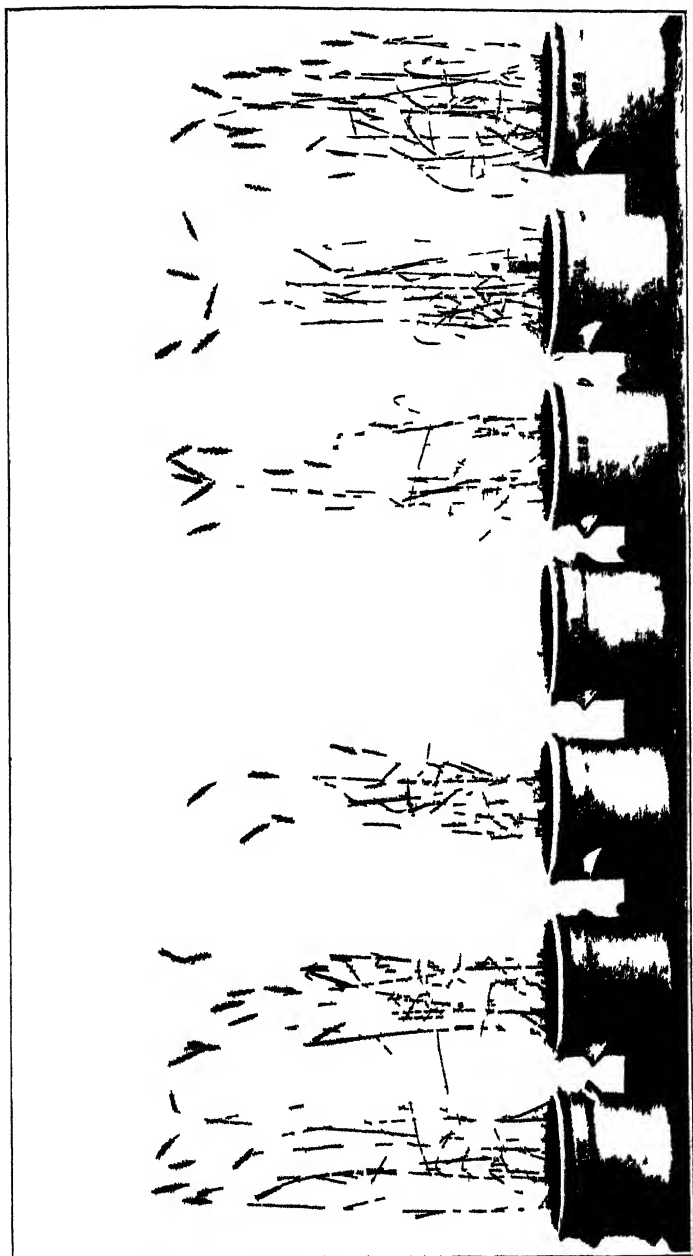
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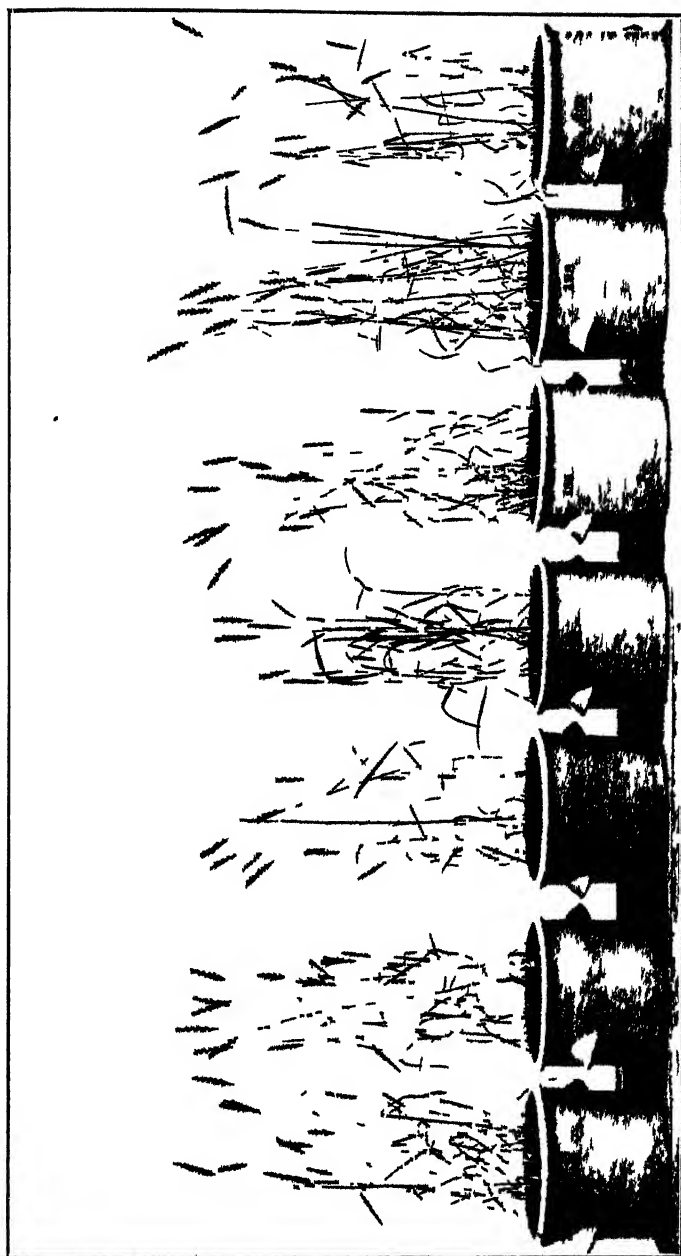
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FIGURE 2.—Carbonate of Lime (CaCO_3) added to an acid soil 1916
 (a) untreated, (b) carbonate of lime = 1 ton CaO per acre, (c) = 2 tons CaO per acre, (d) = 3 tons CaO per acre, (e) = 4 tons CaO per acre.



(a) untreated (b) Magnesium chloride 13 per cent (c) 20 per cent (d) 40 per cent (e) Magnesium sulphate 10 per cent (f) 20 per cent (g) 40 per cent

FIGURE 3.—Magnesium Chloride and Magnesium Sulphate on Wheat 1916



a b c d e f g
 (a) untreated, (b) Sodium chloride, 10 per cent, (c) 15 per cent, (d) 20 per cent, (e) Sodium sulphate 10 per cent, (f) 15 per cent, (g) 20 per cent

FIGURE 4—Sodium Chloride and Sodium Sulphate on Wheat 1916

"nitrolim" would be more generally used, I considered it more desirable to experiment on that than on mustard.

IV. *Felspar as a source of Potash.*

Despite the failure of previous experiments to bring out any result as showing that the potash in felspar might become available for plant use, the work was continued in 1916, the felspar being now used at the rate of 10 cwt. per acre along with lime (5 cwt. per acre), and with chloride of sodium (2 cwt. per acre). Cereals were no longer tried as the crop, but Red clover instead. There is evidence (from the Rothamsted experiments) that soda salts will liberate potash from the soil, and it was desired to see if this took place with felspar. The felspar contained 8.5 per cent. of potash (K_2O) and was very finely ground. All the added materials were ground up with dry soil and mixed with the top 10 lb. of soil in each pot. Further, in order that the plant should not fail from lack of phosphatic food, basic slag was applied in each case at the rate of 5 cwt. per acre. Red Clover was sown on April 8, 1916, and gave a plant which, while rather uneven at first, ultimately grew quite satisfactorily. The crop came into flower by August 21, and was then cut and weighed; a second crop similarly being cut on October 18. In no case, however, did the results obtained differ by much more than what might be due to experimental error, the duplicates showing almost as much difference *inter se* as did one set compared with another. What advantage there was shown was in the case of Salt added to Felspar, but even of this a portion was attributable to the use of the salt alone, and the whole calls for further confirmation. It would be purposeless, therefore, to put out the separate weights for this first season, and so it has been decided to carry on the several sets during 1917.

V. *Experiments on Acid Soils.*

The soil of Stackyard Field on the continuous Wheat and Barley plots has become, where sulphate of ammonia has been used year after year (plot 2a), distinctly acid and unproductive in consequence. For the first twenty years (1877—1896), this effect was not noticeable, but then the soil began to fail, and in December, 1897, lime at the rate of 2 tons per acre was applied and restored the crop, so much so that even now (1917) the effect of this single application has not entirely disappeared (plot 2b). In January, 1905, or seven years after the application of the 2 tons of lime, it was thought well to give a further dressing of 2 tons of lime per acre (plot 2bb), making 4 tons per acre in all to this plot. In the case of the wheat crop (though not of the barley) the result has unexpectedly turned out not to be beneficial, and with one single exception (1915) the produce has

been greater from the 2 tons than from the 4 tons. An explanation of this was sought, and experiments were accordingly devised for testing this at the Pot-culture Station. Various suggestions presented themselves, one, that the extra liming produced too much causticity and possibly removed the vegetable matter too freely. Further, that the explanation of the occurrence of failure with Wheat but not with Barley might be due to the Barley being a "surface-feeder," and that, coming more in contact with the top and more acid surface soil, it might require more neutralisation of this acidity with lime than the deeper-rooted wheat plant which will send its roots down to the less acid portions of the soil.

It was decided, therefore, to take soil from the top 6 inches of the acid plot (2a) of the continuous wheat series and to apply to it caustic lime at different rates, and also lime in the neutral form of Carbonate of Lime. The experiment was arranged, as usual, in duplicate. Lime was applied at the respective rates of 1 ton, 2 tons, 3 tons, and 4 tons per acre, and carbonate of lime in quantity to supply as much lime (CaO) as these several dressings of caustic lime. The caustic lime contained 94.55 per cent. of CaO, and the carbonate of lime 55.52 per cent. of CaO (=99.14 per cent. CaCO_3), and the materials were mixed in each case with the top 14 lb. of soil (40 lb. soil per pot) *i.e.*, to a depth of about 4 inches. The pots were watered and allowed to stand for a few days before planting wheat, so as to let the caustic lime slake. Wheat ("Red Marvel") was sown April 14, 1916. This soil if left to itself will produce an abundant crop of spurrey, and the spurrey was left to grow as it would, and was not removed by weeding. The effects produced by the several applications are well illustrated by Figs. 1 and 2.

As regards the growth of spurrey, it will be observed from the photographs that 1 ton of lime was insufficient to prevent the weed coming, but that 2 tons and higher amounts were quite effectual. With carbonate of lime, on the contrary, spurrey remained in evidence even with the application of the equivalent of 4 tons of lime per acre, though it was in lessened quantity as the dose was increased.

The effects as regards germination were observed, and it is somewhat remarkable that while the plants with caustic lime came up in fairly regular order, those to which the higher amounts of carbonate of lime had been given appeared to be retarded. This may have been due to the larger bulk of the carbonate of lime making the soil lighter and drier. These sets it was noticed were, all through the experiment, drier on the surface than the others.

Though the plants came up in all the pots, those in the untreated, acid soil, soon dwindled away just as they do in the

field, and never attained any growth. With 1 ton of lime there was a great improvement, and still more with 2 tons, the straw here attaining its greatest length. With 3 tons of lime a better-tillered, though shorter-strawed, crop was obtained, and this was still more marked with 4 tons. With carbonate of lime, on the other hand, the difference in length of straw was not so marked, it being much the same with the first three applications, and slightly the longest with the fourth. These details are set out in Table XVI., together with the crop returns.

During the period of growth it was clear that 1 ton of burnt lime per acre was not sufficient to produce a good crop, and in the earlier stages the 2-ton application was the best, but, as time went on, the 3-ton set took a decided lead, the 4 tons not being quite so good, and much shorter in straw. With carbonate of lime the 1-ton treatment was not enough, the other three being all improved and not differing greatly among themselves.

The crop was harvested on September 15, measurements of the ear and straw being previously taken and the plants also photographed.

The general results are given below. These are much in accord with the observations made during growth; the most corn, and also the most straw, was obtained from the 3-ton application of lime. To exceed this amount, however, was not beneficial, thus giving some clue to the non-success in the field when this heavier amount was employed. At the same time both 3 tons and 4 tons gave a higher produce than did 2 tons, though it has to be remembered that in these pot experiments sulphate of ammonia was not put on as was the case in the field. The increasing richness of the grain in nitrogen as more lime was given will be noticed.

TABLE XVI.—*Lime and Carbonate of Lime on Acid Soil, 1916.*

Treatment	Length of Ear	Length of Straw	Weight of		Percent- age of Nitro- gen in grain
			Corn	Straw	
	Inches	Inches	Gms	Gms	
Untreated	—	5 2	15	75	—
Lime (CaO) 1 ton per acre	1 78	21 5	6 92	9 20	1 64
" 2 tons	2 39	23 6	14 80	20 43	2 15
" 3 "	2 26	20 8	19 85	27 88	2 27
" 4 "	2 03	18 1	17 69	26 78	2 43
Carbonate of lime=1 ton lime per acre	2 33	23 7	9 50	10 60	2 05
" " =2 tons	2 27	23 2	12 72	17 60	2 15
" " =3 " " "	2 61	23 0	14 35	19 20	2 15
" " =4 " " "	2 57	24 5	15 88	21 10	2 36

With carbonate of lime it was clear that this could quite well be applied up to the equivalent of 4 tons of lime an acre, the highest yield in corn and straw, as also the most nitrogenous grain, being given with this dressing. The results generally with carbonate of lime were not equal to those with caustic lime, though the 1 ton dressing of each forms an exception. The destruction of spurrey was not complete with the carbonate.

The general conclusion so far (the experiment is being continued in 1917) is that 2-3 tons of caustic lime per acre can safely be used on such a soil as this, but that 4 tons is probably excessive, whereas, if carbonate of lime be employed, the equivalent of 4 tons of lime per acre (say 7 tons) is not too much.

VI. *Magnesium Salts on Wheat.*

In continuation of the work on magnesia it was thought desirable to compare other compounds of magnesium than the oxide and the carbonate. The chloride and sulphate were now selected and applied in different amounts, viz. at the rates of .10, .15, .20, and .40 per cent. of the soil, i.e. 100 parts of the soil would, after the mixing, contain these amounts of the respective salts. These quantities were reckoned on the anhydrous salts MgCl_2 and MgSO_4 , and, reckoned in tons per acre, the applications came to :—

	MgCl_2	$\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$	MgSO_4	$\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$
	Tons	Tons	Tons	Tons
.10 per cent.	1.22	2.59	1.22	2.49
.15 "	1.83	3.89	1.83	3.73
.20 "	2.44	5.18	2.41	4.98
.40 "	4.88	10.36	4.88	9.96

The object, of course, in using the salts to such large extent, was to ascertain the maximum amounts which could be applied to a soil without detriment. The soil used contained lime .30 per cent., magnesia .22 per cent., or a relation of $\text{CaO} : \text{MgO}$ of 1 : .74, and the addition of the magnesia salts raised the relation to figures varying between 1 : .88 (.10 per cent.) and 1 : 1.33 (.40 per cent.) with MgCl_2 , and between 1 : .86 (.10 per cent.) and 1 : 1.21 (.40 per cent.) with MgSO_4 . The salts were mixed with the whole of the soil in each pot, and each experiment was in duplicate.

Spring wheat ("April bearded") was sown on May 4, 1916. Germination was only satisfactory with the lowest application (.10 per cent.) of MgCl_2 in the chloride series, but was quite satisfactory in every instance of the use of the sulphate. It

was thus early seen that magnesia used as chloride in any greater quantity than, say, .10 per cent. of the soil, or 1 ton per acre, was injurious to germination, whereas as sulphate it might be employed up to .40 per cent., or 5 tons per acre, without injuriously affecting germination. Where the plants failed, seed was sown again, but with no better success. These features were reproduced in the growth of the crops, the magnesium chloride plants in any concentration greater than .10 per cent. being decidedly inferior to the untreated, and no plants at all appearing with .40 per cent. Even with .10 per cent. the plants were not as good at first as the untreated, but they pulled up later on. With magnesium sulphate, however, there was no failing whatever, and indeed, with the possible exception of the heaviest (.40 per cent.) dressing, the plants seemed the better the more magnesia as sulphate was applied. The relative appearances are well brought out in Fig. 3.

The measurements of ear and straw did not bring out points other than those observable in Fig. 3, though it will be noted that the straw was shorter with the heaviest (.40 per cent.) dressing of magnesium sulphate.

The crops were harvested September 13-25, and the comparative results are given in Table XVII. :—

TABLE XVII.—*Magnesium Chloride and Magnesium Sulphate on Wheat, 1916.*

Treatment	Comparative Weight		Percentage of Nitrogen in grain
	Corn	Straw	
No treatment	100	100	1.74
Magnesium chloride .10 per cent.	127.0	113.8	1.80
" " .15 "	70.9	76.9	2.21
" " .20 "	70.6	63.1	2.21
" " .40 "	—	—	—
Magnesium sulphate 10 "	111.8	95.6	1.71
" " .15 "	125.9	114.9	1.65
" " .20 "	124.5	119.1	1.68
" " .40 "	151.1	136.9	1.77

From these results it will be seen that with magnesium chloride there was gain in one case only, the lowest (.10 per cent.) application, but that higher amounts injured or destroyed the crop. With magnesium sulphate, on the other hand, there was an increase in all cases, the most being with the heaviest dressing.

It would, therefore, appear from this and earlier experiments that the action of magnesium is very different according

to whether it be combined as the oxide, the carbonate, the chloride, or the sulphate. Notably there is not with magnesium sulphate that increase in nitrogenous contents of the grain that was found so marked when magnesium oxide itself was used. The seeming nitrogenous increase with magnesium chloride is due, no doubt, to the injured crop and not to any direct influence of the application.

It may, accordingly, be concluded from this experiment that:—

1. Magnesium compounds act very differently on wheat according as they are present as the oxide, carbonate, chloride, or sulphate.

2. Magnesium chloride may be used beneficially up to .10 per cent. of the soil—say 1 ton per acre, but above that will injure, or totally destroy, a wheat crop.

3. Magnesium sulphate may be safely and advantageously used up to .40 per cent.—say 5 tons per acre.

4. Increased nitrogen contents of grain obtained by the use of magnesium oxide are not produced with magnesium sulphate.

VII. *Sodium Compounds on Wheat.*

As a companion to the experiments on Magnesium salts, just described, another series with Sodium compounds was carried out. In this case the hydrate (NaOH), the carbonate (Na_2CO_3), the chloride (NaCl), or common salt, and the sulphate (Na_2SO_4) were compared. The details of procedure were much as last related and need not be repeated here. The several amounts in which the materials were used were:—.01, .03, .10, .15, .20 per cent. in the soil, with the hydrate and carbonate, and .10, .15, and .20 per cent. with the chloride and sulphate; the figures given refer in each case to the amount of the anhydrous compound used. The sodium hydrate was applied to the soil in solution, sprayed over it, the whole being then well mixed. The other bodies were in solid form and mixed with the entire soil.

Wheat ("April bearded") was sown on May 5 and 6, 1916. Germination was affected to the following extents:—(a) with sodium hydrate—.03 per cent. slightly, above .03 per cent. decidedly. (b) With carbonate of soda—the same; and it was noticeable that with the application of these two compounds in quantities of .10 per cent. or more, the surface soil soon set into a hard crust and assumed a brownish-black colour; this, no doubt, affected the power of the plant to break through the hardened surface, and it persisted, moreover, throughout the experiment. (c) With sodium chloride—some injury to germination was done with .15 per cent., and with .20 per cent. germination was almost entirely prevented. (d) With sulphate

of soda there was no apparent injury whatever. Re-sowing was done wherever the plants failed.

The effects of the different compounds on the plants were carefully noted during growth. With sodium hydrate the first effect of the .01 per cent. application was to improve the plant, and this was maintained throughout. The .03 per cent. and higher applications, which at first retarded germination, then seemed to lose this power and, on the contrary, to improve the plant, imparting to the leaf a dark-green colour, and giving better tillering. The carbonate gave appearances much in the same direction, though at first hardly as much marked. It was noticeable also that with both the hydrate and the carbonate the straw was shorter but stood up better than in the untreated lots. Measurements of the ears and straw confirmed these observations.

With the chloride (common salt), 10 per cent. (which had not hindered the germination) improved the plant from the beginning and throughout, but .15 per cent. and higher amounts—which had affected germination—never thoroughly recovered, and were worse as more salt was given. They all recovered somewhat as time went on, but never were—as shown in Fig. 4—the equal of the untreated sets, and this though, as stated, there had been re-sowing. It was plain, therefore, that, while .10 per cent. might be beneficial, anything over that amount had harmful effects.

As regards the sulphate, this, which had not retarded the germination, did not seem to materially affect the plant, even with the heaviest (.20 per cent.) application, and the crop showed—as illustrated by Fig. 4—a marked difference to that presented when common salt was used. The crops were harvested September 3—12, and the results are given in Table XVIII.

From these results it may be concluded that :—

1. Different Sodium compounds behave very differently both as regards the effect on germination and the growth of the Wheat crop.

2. Sodium hydrate and Sodium carbonate, while at first retarding germination, effect eventually an improvement in the crop, even when used to the extent of .20 per cent. of the soil, or about $2\frac{1}{4}$ tons per acre. Together with the increase of grain is an increase in its nitrogen contents.

3. Sodium chloride (common salt), while having a beneficial influence if used in amount not exceeding .10 per cent. of the soil (say 1 ton per acre), has in larger quantity a bad effect upon germination and on crop production, and may, in amounts of .20 per cent. ($2\frac{1}{4}$ tons per acre) quite destroy the plant.

4. Sodium sulphate, on the other hand, has neither effect on germination nor on crop production, and may be used up to

TABLE XVIII.—*Sodium Salts on Wheat, 1916.*

Treatment	Length of ear	Length of straw	Comparative weight		Percent- age of nitrogen in grain
			Oorn	Straw	
Untreated	inches 2·70	inches 25·12	100	100	1·90
Sodium hydrate (NaOH) ·01 per cent.	2·72	26·02	97·2	101·4	1·99
" " " ·03 "	2·74	25·00	101·5	109·9	2·08
" " " ·10 "	3·00	21·20	132·0	123·2	2·89
" " " ·15 "	3·16	20·12	130·5	123·4	3·11
" " " ·20 "	3·58	21·15	139·0	131·8	3·33
" carbonate (Na ₂ CO ₃) ·01 "	2·66	25·12	99·6	108·7	1·87
" " " ·03 "	3·00	25·17	100·5	99·4	1·84
" " " ·10 "	2·99	23·15	123·3	117·7	2·02
" " " ·15 "	3·16	22·80	140·6	120·3	2·33
" " " ·20 "	3·32	21·88	138·1	130·5	2·67
Untreated	2·77	24·20	100	100	
Sodium chloride (NaCl) ·10 per cent.	2·91	23·07	115·2	99·6	
" " " ·15 "	2·78	22·50	77·0	67·6	
" " " ·20 "	2·59	20·06	51·6	57·7	
" sulphate (Na ₂ SO ₄) ·10 "	2·76	23·10	106·2	105·4	
" " " ·15 "	2·79	25·32	119·4	114·0	
" " " ·20 "	2·76	23·70	106·0	107·3	

20 per cent. (2½ tons per acre of the anhydrous compound) without detriment.

5. Both sodium hydrate and sodium carbonate produce a "caking" of the soil, not noticeable with the chloride and sulphate, and a darkening of the colour of the soil, and this, on a field scale, would doubtless interfere with the free growth of the plant and the proper aeration of the soil.

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Royal Agricultural Society of England.

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1881	THOROLD, Sir JOHN H., Bart., <i>Old Hall, Syston, Grantham.</i>

Vice-Presidents.

1905	ADEANE, C. R. W., C.B., <i>Babraham Hall, Cambridge.</i>
1887	CRUTCHLEY, PERCY, <i>Sunninghill Lodge, Ascot, Berkshire.</i>
1908	DERBY, Earl of, K.G., <i>Knowsley, Prescott, Lancashire.</i>
1891	DUGDALE, J. MARSHALL, LLwyn, <i>Llanfyllin S.O., Mont.</i>
1903	FELLOWES, Rt. Hon. Sir AILWYN E., K.C.V.O., <i>Honingham, Norwich.</i>
1900	GEEAVES, R. M., <i>Wern, Portmadoc, North Wales.</i>
1904	MATHEWS, ERNEST, <i>Little Shardeloes, Amersham, Bucks.</i>
1908	NORTHUMBERLAND, Duke of, K.G., <i>Alnwick Castle, Northumberland.</i>
1915	PORTLAND, Duke of, K.G., <i>Welbeck Abbey, Worksop, Notts.</i>
1914	POWIS, Earl of, <i>Powis Castle, Welshpool, Mont.</i>
1905	RICHMOND AND GORDON, Duke of, K.G., <i>Goodwood, Chichester.</i>
1907	YARBOROUGH, Earl of, <i>Brookley Park, Lincolnshire.</i>

Ordinary Members of the Council.

1910	ALEXANDER, D. T., <i>Bryneithen, Dinas Powis (Glamorganshire).</i>
1905	AVELING, THOMAS L., <i>Boley Hill House, Rochester (Kent).</i>
1911	BEHRENS, Capt. CLIVE, <i>Swinton Grange, Malton (Yorks., N. Riding).</i>
1906	BROCKLEHURST, HENRY DENT, <i>Suddley Castle, Winchcombe (Glos.).</i>
1910	BROWN, DAVIS, <i>Marham Hall, Downham Market (Norfolk).</i>
1906	BUTTAR, THOMAS A., <i>Corston, Coupar Angus (Scotland).</i>
1905	CARR, RICHARDSON, <i>Mill Lawn, Burley, Ringwood, Hants (Hertfordshire).</i>
1913	CHAPMAN, W. W., 4 <i>Mowbray House, Norfolk Street, W.C. (London).</i>
1909	CROSS, Hon. JOHN E., <i>High Legh, Knutsford (Cheshire).</i>

Year when
first elected
on Council

Ordinary Members of the Council (continued).

1905	EADIE, JOHN T. C., <i>Aldershaw, Lichfield, Staffs. (Derbyshire).</i>
1911	EVANS, ARTHUR E., <i>Bronwyfa, Wrexham (North Wales).</i>
1913	EVENS, JOHN, <i>Burton, near Lincoln (Lincolnshire).</i>
1905	FALCONER, JAMES, <i>Northbrook Farm, Micheldever Station (Hampshire).</i>
1916	FITZHERBERT-BROCKHOLES, W., <i>Cloughton Hall, Garstang (Lancs.).</i>
1916	FRANCE-HAYHURST, Capt. W. H., <i>Bostock Hall, Middlewich (Cheshire).</i>
1907	FRANK, SIR HOWARD, 20 <i>Hanover Square, W. (London).</i>
1909	GARNE, W. T., <i>Aldsworth, Northleach (Gloucestershire).</i>
1916	GILBEY, Sir WALTER, Bart., <i>Elsenham Hall, Elsenham (Essex).</i>
1910	HARLECH, Lord, <i>Brogintyn, Oswestry (Shropshire).</i>
1905	HARRIS, JOSEPH, <i>Brackenbrough Tower, Carlisle (Cumberland).</i>
1903	HARRISON, WILLIAM, <i>Hall House, Leigh (Lancashire).</i>
1911	HASTINGS, Lord, <i>Melton Constable Park (Norfolk).</i>
1909	HAZLERIGG, Sir ARTHUR G., Bart., <i>Noseley Hall (Leicestershire).</i>
1905	HISCOCK, ARTHUR, <i>Manor Farm, Mottcombe, Shaftesbury (Dorset).</i>
1903	HOBBS, ROBERT W., <i>Kelmescott, Lechlade (Oxfordshire).</i>
1900	HOWARD, JOHN HOWARD, <i>Clapham Park, near Bedford (Bedfordshire)</i>
1905	INGRAM, WALTER F., 2 <i>St. Andrew's Place, Lewes (Sussex).</i>
1913	KELLY, Capt. DUNBAR, <i>Coombe Farm, Kingston-on-Thames (Surrey).</i>
1905	KNIGHTLEY, Sir CHARLES V., Bart., <i>Fawsley, Daventry (Northants).</i>
1912	LANE-FOX, Major G. R., M. P., <i>Bramham Park, Boston Spa (Yorks, W.R.).</i>
1909	LUDDINGTON, J. L., <i>Littleport, Ely (Cambridgeshire).</i>
1909	MANSELL, ALFRED, <i>College Hill, Shrewsbury (Shropshire).</i>
1916	MANNERS, Esq., <i>Thoresby Park, Newark-on-Trent (Nottinghamshire).</i>
1904	MIDDLETON, CHRISTOPHER, <i>Vane Terrace, Darlington (Durham).</i>
1910	MIDWOOD, G. NORRIS, <i>The Grange, North Rode, Congleton (Cheshire).</i>
1916	MOUNT, W. A., M. P., <i>Wasing Place, Reading (Berkshire).</i>
1911	MYATT, JOHN, <i>Lynn House, Lichfield (Staffordshire).</i>
1915	OLIVER-BELLASIS, Capt. R., <i>Shilton House, Coventry (Warwickshire).</i>
1910	OVERMAN, HENRY, <i>Weasenham, Swaffham (Norfolk).</i>
1909	PATTERSON, R. G., <i>Acton Hill, Stafford (Staffordshire).</i>
1912	PERKIN, A. W., <i>Greenford Green, Harrow (Middlesex).</i>
1906	PLUMPTRE, H. FITZWALTER, <i>Goodnestone, near Canterbury (Kent).</i>
1916	PRICE, F. HAMLYN, 11 <i>Ormonde Terrace, Regent's Park, N.W. (London).</i>
1909	RANKSBOROUGH, Lord, C.V.O., C.B., <i>Ranksborough, Oakham (Rutland).</i>
1913	RAWLENCE, J. E., <i>The Chantry, Wilton, Salisbury (Wiltshire).</i>
1905	REA, GEORGE GREY, <i>Doddington, Wooler, R.S.O. (Northumberland).</i>
1897	REYNARD, FREDERICK, <i>Sunderlandwick, Driffield (Yorks., E. Riding).</i>
1916	ROGERS, ANDREW, <i>Great Woodford, Plympton (Devonshire).</i>
1897	ROGERS, C. COLTMAN, <i>Stanage Park, Bampton Bryan (South Wales).</i>
1905	BOWELL, JOHN, <i>Bury, Huntingdon (Huntingdonshire).</i>
1913	SEWARD, Capt. PERCY W., <i>Weston, Petersfield (Hampshire).</i>
1907	SMITH, FRED, <i>Deben Haugh, Woodbridge (Suffolk).</i>
1891	STANTFORTH, Lt.-Col. E. W., <i>Kirk Hammerton Hall, York (Yorks., W.R.).</i>
1912	STRACHIE, Lord, <i>Sutton Court, Pensford (Somerset).</i>
1916	THURSBY, Sir JOHN, O. S., Bt., <i>Ormerod House, Burnley (Lancashire).</i>
1907	TINDALL, C. W., <i>Wainfleet, S.O. (Lincolnshire).</i>
1916	TRANT, BROOKING, <i>Trethawle, Liskeard (Cornwall).</i>
1904	TURNER, ARTHUR P., <i>Fayre Oakes, Hereford (Herefordshire).</i>
1889	WHEELER, Col. E. VINCENT V., <i>Newnham Court, Tenbury (Worcestershire).</i>
1915	WHITE, Capt. J. BELL, R.N.R., <i>Alderbourne Manor, Gerrards Cross (Buckinghamshire).</i>
1889	WILSON, Col. C. W., <i>Rigmaden Park, Kirkby Lonsdale (Westmorland).</i>
1916	WRENCH, Rt. Hon. FREDERICK, <i>Killacoona, Ballybrack, Co. Dublin (Ireland).</i>
1908	WRIGLEY, LOUIS O., 7 <i>Park Street, Cirencester (Monmouthshire).</i>

STANDING COMMITTEES.

* * Under By-law 39, the PRESIDENT is a Member *ex officio* of all Committees, and the TRUSTEES and VICE-PRESIDENTS are Members *ex officio* of all Standing Committees except the Committee of Selection.

The Honorary Director is a Member ex officio of all Committees.

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NORTHBROOK, Earl of.	CARR, RICHARDSON.	MATHEWS, ERNEST.
FELLOWES, Rt. Hon. Sir A. E.	CORNWALLIS, Col.	MIDWOOD, G. NORRIS.
GREENALL, Sir G., Bart.	CRUTCHLEY, PERCY.	WHEELER, Col.
THOROLD, Sir J. H., Bart.	HARRISON, W.	

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MORETON, Lord.	DUGDALE, J. MARSHALL.	WHEELER, Col.
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(<i>Chairman</i>).	FITZHERBERT-	Capt. R.
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STRACHIE, Lord.	EADIE, J. T. C.	RAWLENCE, J. E.
FELLOWES, Rt. Hon. Sir A. E.	FITZHERBERT-	ROWELL, JOHN.
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BEHRENS, Capt. OLIVE.	COMPANY.	WILSON, Col. C. W.
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* *Professional Members of Veterinary Committee not Members of Council.*

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HARLECH, Lord.	GARNE, W. T.	SMITH, FRED.
MIDDLETON, Lord.	GREAVES, R. M.	TINDALL, C. W.
BOWEN-JONES, Sir J. B., Bart.	HOBBS, ROBERT W.	TRANT, B.
GREENALL, Sir G., Bart.	MANSSELL, ALFRED.	TURNER, A. P.
BEHRENS, Capt. OLIVE.	MATHEWS, ERNEST.	WILSON, Col. C. W.
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CARR, RICHARDSON.	OVERMAN, HENRY.	Live Stock.

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CROSS, Hon. J. E.	HARRISON, W.	STANFORTH, Lt.-Col.
BOWEN-JONES, Sir J. B., Bart.	HOWARD, JOHN HOWARD.	WHEELER, Col.
ALEXANDER, D. T.	LUDDINGTON, J. L.	The Stewards of
AVELING, T. L.	MIDDLETON, C.	Implements.
CRUTCHLEY, PERCY.	MYATT, JOHN.	

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(<i>Chairman</i>).	CRUTCHLEY, PERCY.	REYNARD, F.
CROSS, Hon. J. E.	HARRISON, W.	STANFORTH, Lt.-Col.
ALEXANDER, D. T.	HOWARD, J. HOWARD.	Steward of Forage.
AVELING, T. L.	OVERMAN, HENRY.	

Committee of Selection.

THOROLD, Sir J. H., Bart.	RICHMOND AND GORDON,	EVENS, JOHN.
(<i>Chairman</i>).	Duke of.	HOWARD, J. HOWARD
THE PRESIDENT.	ALEXANDER, D. T.	MIDWOOD, G. NORRIS.
PORTLAND, Duke of.		

And the Chairman of each of the Standing Committees.

Dairy and Produce Committee.

MATHEWS, ERNEST	CARR, RICHARDSON.	OLIVER-BELLANTS,
(<i>Chairman</i>).	CRUTCHLEY, PERCY.	Capt. R.
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HASTINGS, Lord.	EVENS, JOHN.	PLUMPTRE, H. F.
STRACHIE, Lord.	FITZHERBERT-	SMITH, FRED.
PARKER, Hon. C. T.	BROCKHOLES, W.	TRANT, BROOKING.
THOROLD, Sir J. H., Bart.	GREAVES, R. M.	WHEELER, Col.
BEHRENS, Capt. OLIVE.	KELLY, Capt.	

Special Committee.

DEVONSHIRE, Duke of	AVELING, T. L.	*NUTTALL, Prof.
(<i>Chairman</i>).	*BIFFEN, Prof. R. H.	REYNARD, F.
NORTHBROOK, Earl of.	CARR, RICHARDSON.	ROGERS, C. C.
FELLOWES, Rt. Hon. Sir A. E.	*COOPER, W. F.	TINDALL, C. W.
BOWEN-JONES, Sir J. B., Bart.	CORNWALLIS, Col.	*VOELCKER, Dr. J. A.
GREENALL, Sir G., Bart.	CRUTCHLEY, PERCY.	*WARBURTON, C.
THOROLD, Sir J. H., Bart.	GREAVES, R. M.	WHEELER, Col.
*McFADYEAN, Prof. Sir J.	HARRISON, W.	*WOOD, Prof. T. B.
ADEANE, C. R. W.	MATHEWS, ERNEST.	

* Scientific Members of Special Committee not Members of Council.

War Emergency Committee.

ADEANE, C. R. W. (<i>Chairman</i>).	CARR, RICHARDSON.	MIDDLETON, C.
PORTLAND, Duke of.	EVENS, JOHN.	OVERMAN, H.
RICHMOND AND GORDON,	HOBBS, R. W.	PATTERSON, R. G.
Duke of.	HOWARD, J. HOWARD.	ROWELL, JOHN.
NORTHBROOK, Earl of.	LUDDINGTON, J. L.	TINDALL, C. W.
GREENALL, Sir G., Bart.	MANSSELL, ALFRED.	PRICE, F. HAMLYN.
THOROLD, Sir J. H., Bart.	MATHEWS, ERNEST.	(<i>Hon. Secretary</i>).

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Secretary.—THOMAS MORROW, 16 Bedford Square, W.C.1.

Editor of Journal.—C. S. ORWIN, Hon. M.A., *Agricultural Economics Institute, Oxford.*

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DISTRIBUTION OF GOVERNORS AND MEMBERS OF THE SOCIETY, AND OF ORDINARY MEMBERS OF THE COUNCIL.

Electoral District	Division	Number of Governors and Members	Number of Ordinary Members of Council	Ordinary Members of Council
A.	BEDFORDSHIRE	70	1	J. H. Howard.
	CHESHIRE	502	3	Hon. J. E. Cross; Capt. W. H. France-Hayhurst; G. Norris Midwood.
	CORNWALL	85	1	Brooking Tiant.
	DERBYSHIRE	185	1	J. T. O. Eadie.
	DORSET	82	1	A. Hiscock.
	HAMPSHIRE AND CHANNEL ISLANDS	310	2	J. Falconer; Capt. Percy Seward.
	HERTFORDSHIRE	180	1	Richardson Carr.
	LANCASHIRE AND ISLE OF MAN	551	3	W. Fitzherbert-Brockholes; W. Harrison; Sir John O. S. Thursby.
	MIDDLESEX	96	1	A. W. Perkin.
	MONMOUTHSHIRE	83	1	L. O. Wrigley.
	NORFOLK	436	3	Davis Brown; Lord Hastings; Henry Overman.
	NORTHAMPTONSHIRE	188	1	Sir C. V. Knightley.
	NORTHUMBERLAND	241	1	G. G. Rea.
	STAFFORDSHIRE	284	2	John Myatt; R. G. Patterson.
	WORCESTERSHIRE	182	1	Col. E. V. V. Wheeler.
	YORKSHIRE, N.R.	175	1	Capt. Olive Behrens.
	SCOTLAND	218	1	T. A. Buttar.
		—3,910	—25	
B.	BUCKINGHAMSHIRE	138	1	Capt. J. Bell White, R.N.R.
	DEVON	156	1	A. Rogers.
	DURHAM	122	1	C. Middleton.
	ESSEX	170	1	Sir Walter Gilbey.
	HEREFORDSHIRE	133	1	A. P. Turner.
	LEICESTERSHIRE	170	1	Sir A. G. Hazlerigg.
	LONDON	518	3	W. W. Chapman; Sir Howard Frank; F. Hamlyn Price.
	NOTTINGHAMSHIRE	203	1	Earl Manvers.
	RUTLAND	23	1	Lord Ranksborough.
	SHERIFFSHIRE	410	2	Lord Harlech; Alfred Mansell.
	SUFFOLK	205	1	Fred Smith.
	SURREY	210	1	Capt. Dunbar Kelly.
	WILTSHIRE	155	1	James E. Rawlence.
	YORKSHIRE, W.R.	322	2	Major G. R. Lane-Fox, M.P.
C.	SOUTH WALES	125	1	Lt.-Col. E. W. Stanyforth.
		—3,061	—19	C. O. Rogers.
	BERKSHIRE	178	1	W. A. Mount, M.P.
	CAMBRIDGESHIRE	161	1	J. L. Luddington.
	CUMBERLAND	104	1	Joseph Harris.
	GLAMORGAN	93	1	D. T. Alexander.
	GLOUCESTERSHIRE	321	2	H. D. Brookhurst; W. T. Garne.
	HUNTINGDONSHIRE	47	1	John Rowell.
	KENT	337	2	T. L. Aveling; H. F. Plumptre.
	LINCOLNSHIRE	329	2	John Evans; C. W. Tindall.
	OXFORDSHIRE	162	1	R. W. Hobbs.
	SOMERSET	150	1	Lord Strachan.
	SUSSEX	269	1	W. F. Ingram.
	WARWICKSHIRE	224	1	Capt. R. Oliver-Bellasis.
	WESTMORLAND	53	1	Col. C. W. Wilson.
	YORKSHIRE, E.R.	143	1	F. Reynard.
	IRELAND	112	1	Right Hon. F. Wronch.
	NORTH WALES	268	1	A. E. Evans.
		—2,960	—19	
FOREIGN COUNTRIES		287		
MEMBERS WITH NO ADDRESSES		20		
GRAND TOTALS		10,248	63	

TABLE SHOWING THE NUMBER OF GOVERNORS AND MEMBERS
IN EACH YEAR FROM THE ESTABLISHMENT OF THE SOCIETY.

Year ending with Show of	President of the Year	Governors		Members			Total.
		Life	Annual	Life	Annual	Honor- ary	
1839	3rd Earl Spencer	—	—	—	—	—	1,100
1840	5th Duke of Richmond	86	189	146	2,434	5	2,860
1841	Mr. Philip Pusey	91	219	231	4,047	7	4,595
1842	Mr. Henry Handley	101	211	238	5,194	15	5,849
1843	4th Earl of Hardwicke	94	209	429	8,155	15	8,902
1844	3rd Earl Spencer	95	214	442	8,161	15	8,927
1845	5th Duke of Richmond	94	198	527	5,899	15	6,733
1846	1st Viscount Portman	92	201	554	6,105	19	6,971
1847	6th Earl of Egmont	91	195	607	5,478	20	6,391
1848	2nd Earl of Yarborough	93	186	648	5,387	21	6,335
1849	3rd Earl of Chichester	89	178	582	4,643	20	5,512
1850	4th Marquis of Downshire	90	169	627	4,856	19	5,261
1851	5th Duke of Richmond	91	162	674	4,175	19	5,121
1852	2nd Earl of Duane	93	156	711	4,002	19	4,981
1853	2nd Lord Ashburton	90	147	739	3,928	19	4,923
1854	Mr. Philip Pusey	88	146	771	4,152	20	5,177
1855	Mr. William Miles, M.P.	89	141	795	3,838	19	4,882
1856	1st Viscount Portman	85	139	839	3,896	20	4,979
1857	Viscount Ossington	83	137	896	3,933	19	5,068
1858	6th Lord Bessers	81	133	904	4,010	18	5,146
1859	7th Duke of Marlborough	78	130	927	4,008	18	5,161
1860	5th Lord Walsingham	73	119	927	4,047	18	5,183
1861	3rd Earl of Powis	84	90	1,113	3,328	18	4,633
1862	(H.R.H. The Prince Consort 1st Viscount Portman)	83	97	1,151	3,475	17	4,828
1863	Viscount Eversley	80	88	1,263	3,785	17	5,133
1864	2nd Lord Feversham	78	45	1,343	4,013	17	5,496
1865	Sir E. O. Kerrison, Bart., M.P.	79	81	1,396	4,190	16	5,752
1866	1st Lord Tredegar	79	84	1,395	4,049	15	5,622
1867	Mr. H. S. Thompson	77	82	1,388	3,903	15	5,465
1868	6th Duke of Richmond	75	74	1,409	3,888	15	5,461
1869	H.R.H. The Prince of Wales, K.G.	75	78	1,417	3,894	17	5,446
1870	7th Duke of Devonshire	74	74	1,511	3,764	15	5,436
1871	8th Lord Vernon	72	74	1,589	3,896	17	5,648
1872	Sir W. W. Wynn, Bart., M.P.	71	73	1,655	3,953	14	5,768
1873	Lord Cathcart	74	62	1,832	3,936	12	5,916
1874	Mr. Edward Holland	76	58	1,944	3,756	12	5,846
1875	Viscount Bridport	79	79	2,058	3,918	11	6,145
1876	2nd Lord Chesham	83	78	2,164	4,013	11	6,349
1877	Lord Skelmersdale	81	76	2,239	4,073	17	6,486
1878	Col. Kingscote, O.B., M.P.	81	72	2,328	4,130	26	6,837
1879	H.R.H. The Prince of Wales, K.G.	81	72	2,453	4,700	26	7,332
1880	9th Duke of Bedford	83	70	2,673	5,083	20	7,929
1881	Mr. William Wells	85	69	2,765	5,041	19	7,979
1882	Mr. John Dent Dent	82	71	2,849	5,059	19	8,080
1883	6th Duke of Richmond and Gordon	78	71	2,979	4,952	19	8,099
1884	Sir Brandreth Gibbs	72	72	3,203	5,408	21	8,776
1885	Sir M. Lopes, Bart., M.P.	71	69	3,356	5,619	20	9,135
1886	H.R.H. The Prince of Wales, K.G.	70	61	3,414	5,569	20	9,134
1887	Lord Egerton of Tatton	71	64	3,440	5,887	20	9,982
1888	Sir M. W. Ridley, Bart., M.P.	66	56	3,521	5,225	16	8,884
1889	HER MAJESTY QUEEN VICTORIA	73	58	3,567	7,153	15	10,866
1890	Lord Moreton	122	58	3,646	6,941	17	10,984
1891	2nd Earl of Ravensworth	117	60	3,811	6,921	19	10,928
1892	1st Earl of Feversham	111	69	3,784	7,096	20	11,060
1893	1st Duke of Westminster, K.G.	107	74	3,786	7,138	21	11,126
1894	8th Duke of Devonshire, K.G.	113	73	3,798	7,212	23	11,218
1895	Sir J. H. Thorold, Bart.	120	80	3,747	7,179	23	11,149
1896	Sir Walter Gilbey, Bart.	126	83	3,695	7,253	23	11,180
1897	H.R.H. The Duke of York, K.G.	126	83	3,705	7,285	24	11,223
1898	5th Earl Spencer, K.G.	121	79	3,687	7,182	25	11,094
1899	Earl of Coventry	116	75	3,656	7,099	23	10,879
1900	H.R.H. The Prince of Wales, K.G.	111	71	3,628	6,832	24	10,866
1901	3rd Earl Cawdor	102	70	3,564	6,338	27	10,083
1902	H.R.H. Prince Christian, K.G.	100	69	3,500	5,955	26	9,650
1903	H.R.H. The Prince of Wales, K.G.	99	62	3,439	5,771	27	9,898
1904	16th Earl of Derby, K.G.	96	68	3,375	5,906	32	9,477
1905	Lord Middleton	89	78	3,212	5,758	33	9,170
1906	Mr. F. S. W. Cornwallis	94	155	3,132	6,180	30	9,600
1907	Earl of Yarborough	91	174	3,076	6,299	29	9,669
1908	Duke of Devonshire	89	178	3,019	6,442	30	9,758
1909	7th Earl of Jersey, G.O.B.	91	177	2,951	6,696	31	9,946
1910	Sir Gilbert Greenall, Bart.	86	166	2,878	6,994	31	10,095
1911	HIS MAJESTY KING GEORGE V.	85	168	2,805	7,191	30	10,279
1912	Lord Middleton	85	170	2,741	7,288	30	10,809
1913	Earl of Northbrook	89	168	2,691	7,474	26	10,448
1914	Earl of Powis	89	173	2,626	7,629	28	10,545
1915	Duke of Portland, K.G.	88	184	2,517	7,813	28	10,180
1916	7th Duke of Richmond and Gordon, K.G.	83	185	2,427	7,526	27	10,248

STATEMENT made to the Council by the Chairman
of the Finance Committee, on presenting the
Accounts for the year 1916.

Mr. ADEANE, in presenting, on behalf of the Finance Committee, the accounts of the Society for the year 1916, asked the Council to adopt the accounts for the year 1916, and to receive an estimate of the ordinary receipts and expenditure for 1917. The credit balance for 1916 was 8517., as against a debit balance in 1915 of 1,7617. That debit balance was largely due to the expenses connected with the conversion of Consols, and to the large contributions which were made to the Agricultural Relief of Allies Fund and to the National Relief Fund of 1,000% each. There was an increase under the heading of expenditure in regard to printing which he was afraid would go on as long as the war continued.

With regard to the balance-sheet, he would point out that in 1915 they wrote down their capital very considerably—to the extent of over 10,000%—to meet depreciation of Consols and the debit balances on the Show and ordinary account for that year. He was glad to say that in 1916 they had almost recovered their position, having added to capital account no less than 8,098%. That was due to the large and satisfactory profit made at the Manchester Show, and also to the credit balance which they had on their ordinary account.

The Committee estimated that the receipts for the year 1917 would amount to 10,350%, as against 10,018% last year. On the expenditure side the estimates were: Salary of secretary and official staff, 1,586%; pensions, 140%; rent, lighting, &c., 750%; printing and stationery, 450%; postage and telegrams, 160%; miscellaneous, 250%; Journal, 880%; Chemical Department, 710%; contribution to Woburn Farm, 150%; contribution to Hills' Bequest, 75%; Botanical Department, 250%; Zoological Department, 200%; Veterinary Department, 400%; Consulting Engineer, 52%; examination for National Diploma (R.A.S.E. share), 220%; contribution from subscriptions to Show Fund, 2,500%. In regard to the last-mentioned item, the whole of that amount had been expended in moving the Society's Show plant from Manchester to Cardiff and housing it there.

Under the head of exceptional expenditure he had to ask the Council to sanction an amount of 250% towards the

expenses of the War Emergency Committee and 100% to the Reading Dairy Research Institute. Altogether the total estimated expenditure was 9,123/., giving an estimated credit balance of 1,227/.

FORECAST OF ORDINARY RECEIPTS AND EXPENDITURE FOR 1917.

(Other than in respect of the Show.)

Prepared by direction of the Finance Committee on the basis of the Recommendations of September 21, 1905, made by the Special Committee.

Actual Figures for 1916.	Receipts.	£
£		£
8,393	From Subscriptions for 1917 of Governors and Members	8,250
143	From Interest on Daily Balances	100
1,466	From Interest on Investments	1,800
116	From Sales of Text Books, Pamphlets, &c.	100
	(This does not include the sales of Journals which are deducted from the cost of production.)	
<u>10,018</u>		<u>10,950</u>

£	Expenditure.	£
1,507	Salary of Secretary and Official Staff	1,586
140	Pensions to Officials	140
814	Rent, Lighting, Cleaning, Wages, &c. (say)	750
575	Printing and Stationery	450
186	Postage and Telegrams	160
272	Miscellaneous	250
1,080	Journal	880
711	Chemical Department	710
150	Contribution to Woburn Farm	150
51	Contribution to Mills' Bequest	75
250	Botanical Department	250
200	Zoological Department	200
402	Veterinary Department	400
52	Consulting Engineer	52
152	Examinations for National Diploma (R.A.S.E. Share)	220
2,500	Contribution from Subscriptions to Show Fund (Liabilities already incurred to this amount)	2,500
<u>9,042</u>		<u>8,778</u>

£	Exceptional Expenditure.	£
120	Excess expenditure in production of Volume 76 of Journal	—
5	Donation to Road Transport Association	—
—	War Emergency Committee	250
—	Grant to the Reading Dairy Research Institute	100
<u>9,167</u>		<u>9,123</u>
	Estimated Receipts	£ 10,950
	Estimated Expenditure	9,123
851	Estimated Receipts over Expenditure	<u>1,227</u>

Royal Agricultural Society of England.

STATEMENT OF FUNDS HELD BY THE SOCIETY IN TRUST OR WHICH ARE NOT CONSIDERED AVAILABLE FOR GENERAL PURPOSES, DECEMBER 30, 1916.

To Hills' Bequest for Pot-culture Experiments.	£	s.	d.		£	s.	d.
Less: Depreciation of Consols at time of conversion	£	s.	d.	9,000	0	0	
" Cost of conversion	£	s.	d.	3,532	7	11	
				134	14	7	
				3,717	2	6	
				5,282	17	6	
To Fund provided by Sir Walter Gilbey for Endowment of Lectureship at Cambridge until July 31, 1917, when any balance on this account will become the property of the Society				1,115	12	1	
				£1,115	12	1	
To Superannuation and Insurance Fund:— Amount set aside in accordance with Declaration of Trust of July 28, 1911	£	s.	d.	9,171	5	0	
Less: Depreciation of Consols at time of conversion	£	s.	d.	1,937	18	4	
" Cost of conversion	£	s.	d.	2,094	1	4	
Accumulations to December 30, 1916				7,077	3	8	
				517	2	8	
				£7,594	5	11	
By E.282L 17s. 6d. $\frac{1}{4}$ % War Stock (1925-1945) at cost. (Value on December 30, 1916, at 96 $\frac{1}{8}$ =5,078L 3s. 3d.)				5,282	17	6	
By 1,140L Metropolitan Water A Stock at cost. (Value on December 30, 1916, at 88=661L 4s. 0d.)				998	1	0	
By amount included in the Society's Sundry Creditors' Account:—				£	s.	d.	
Fund uninvested				1	19	0	
Accumulated income				115	12	1	
				117	11	1	
				£1,115	12	1	
By Investments in names of Trustees of Superannuation and Insurance Funds, viz:— 11,000L Consols, converted into 7,077L 3s. 8d. $\frac{1}{4}$ % War Stock (1925-1945) (Value on December 30, 1916, at 96 $\frac{1}{8}$ =6,802L 18s. 10d.) 289L 9s. 6d. West Australian $\frac{3}{4}$ % Stock (1935-1955) at cost 140L 4s. 6d. Queensland $\frac{3}{4}$ % Stock (1950-1970) at cost Cash at Bank				7,077	3	8	
				247	19	0	
				120	17	11	
				148	5	4	
				£7,594	5	11	

Examined, audited, and found correct, this 8th day of February, 1917.

THOMAS MCROW, Secretary.
WELTON, JONES & CO., Accountants.

JONAS M. WEBB,
HUBERT J. GREENWOOD,
NEWELL P. SQUAREY,
Auditors on behalf of the Society.

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ROYAL AGRICULTURAL

Dr.

BALANCE-SHEET,

Corresponding
figures
for 1915

£

2,096

42

1,928

4,056

2,704

57,854

445

57,409

252

50

57,711

19,381

47,330

24

94

5

126

50

-97

47,931

653,791

£ s. d.

£ s. d.

£ s. d.

To SUNDRY CREDITORS—

Sundry Creditors

2,381 8 6

Subscriptions received in 1916 in advance

72 5 0

To Loan

2,453 13 6

To CAPITAL—

As at December 31, 1915

47,030 16 0

SHOW FUND—

Profit on Show at Manchester

4,480 19 1

Contribution from Ordinary Account

2,500 0 0

Life Compositions received in 1916

6,980 19 1

Donation towards the Society's Funds

508 0 0

Credit balance on ordinary income and expendi-

ture account

50 0 0

850 19 9

55,418 14 10

DEPRECIATIONS written off, viz. :-

Fixtures

22 13 6

Furniture

84 8 5

Machinery

4 15 6

Show Plant

128 1 1

Buildings at Woburn

50 0 0

289 18 6

55,128 16 4

657,582 9 10

THOMAS MORROW, *Secretary.*WELTON, JONES & CO., *Accountants.*

SOCIETY OF ENGLAND.

DECEMBER 30, 1916.

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Cr.

Corresponding figures for 1915		£ s. d.	£ s. d.
£	By RESERVE FUND—		
35,409	35,408l 13s. 4d. 4½ per cent War Stock (1925-1945) received, under the conversion right, for 59,113l Consols		35,408 13 4
	(Value on December 30, 1916 @ 90½ = 51,036l 11s. 7d)		
2,500	2,840l 13s. 6d Metropolitan 3 per cent Consolidated Stock (1941) at 87½		2,500 0 0
	(Value on December 30, 1916, @ 87 = 1,903l 5s 0d)		
6,300	6,528l 1s. 6d Canadian 4 per cent Stock (1940-1960) at 96½		6,300 0 0
	(Value on December 30, 1916, @ 81 = 5,416l 6s 0d)		
—	5,500l 6 per cent Exchequer Bonds (1920) at par (Value on December 30, 1916, @ 99½ = 5,489l 13s. 9d)		5,500 0 0
	By LEASE OF 16 BEDFORD SQUARE	2,100 0 0	
2,100	Less Amount written off	100 0 0	2,000 0 0
	By FIXTURES—		
	Value at December 31, 1915	301 13 3	
302	Less Depreciation at 7½ per cent	22 13 6	278 19 9
	By FURNITURE—		
	Value at December 31, 1915	844 4 3	
844	Less Depreciation at 10 per cent.	84 8 5	759 15 10
1,500	By PICTURES (500l) and BOOKS (1,000l).		1,500 0 0
	By MACHINERY—		
	Value at December 31, 1915	47 15 5	
48	Less Depreciation at 10 per cent.	4 15 6	42 19 11
	By SHOW PLANT—		
	Value at December 31, 1915	1,280 10 9	
	Less Depreciation at 10 per cent.	128 1 1	
		1,152 9 8	
1,281	Added during 1916	31 14 0	1,177 3 8
	By BUILDINGS FOR POT EXPERIMENTS AT WOBURN—		
	As per Account at December 31, 1915	200 0 0	
200	Less Depreciation	50 0 0	150 0 0
	By EXPENDITURE ON FORTHCOMING SHOW AT CARDIFF		54 8 2
1,887	By SUNDRY DEBTORS		1,380 7 0
	By CASH AT BANKERS AND IN HAND—		
	Ordinary Account	440 3 7	
	In Hand	89 18 7	530 2 2
1,420			
£53,791			£57,582 9 10

Examined, audited, and found correct, this 8th day of February, 1917.

JONAS M. WEBB,
HUBERT J. GREENWOOD, } Auditors on behalf of the Society.

STATEMENT OF ORDINARY INCOME

The Expenditure in this account includes not only cash payments,

Corresponding figures for 1915.					
6					
944	ANNUAL SUBSCRIPTIONS:—		£ s. d.	£ s. d.	
88	Governors: Subscriptions for 1916		956 0 0		
6,734	Members: Received in 1915, but belonging to 1916		42 8 0		
104	Subscriptions for 1916		7,060 1 8		
64	Subscriptions for 1916 (additional)		90 15 0		
	Subscriptions for previous years		83 2 0		
87	LIFE GOVERNORS AND MEMBERS:—				
8,021	Annual Contributions		70 19 0	8,293	8 8
75	MISCELLANEOUS:—				
1,690	Interest on Daily Balances		142 13 5		
25	Income from Investments		1,466 3 10		
113	Sales of Pamphlets, Diagrams, &c.		24 16 2		
13	Sales of Text Book		77 4 1		
1,916	Miscellaneous		13 13 0	1,724	10 6
	Rent of 12 Hanover Square		280 10 0		
	Less Rent paid		280 10 0		
9,937					
1,761					
£11,698					
	Debit balance carried to Balance Sheet				
				£10,017	19 2

THOMAS McROW, *Secretary.*
WELTON, JONES & CO., *Accountants.*

AND EXPENDITURE FOR THE YEAR 1916.

xiji

but all liabilities in connection with the year's transactions.

Corresponding figures for 1915		Expenditure.		
6		GENERAL ADMINISTRATION:—		
1,569		Salaries of Official Staff	£	s. d.
140		Pensions to Officials	1,506	17 6
99		Legal Charges and Auditors' Fees	140	0 0
791		Rent, Rates, Taxes, Insurance, and House Expenses	57	15 0
7		Purchase and Binding of Books	813	19 10
390		Printing and Stationery	35	17 6
157		Postage and Telegrams	574	13 8
90		Carriage of Parcels and Travelling Expenses	186	4 8
78		Advertising and Miscellaneous Office Expenses	58	12 0
3,327			85	8 3
				3,459 8 5
		JOURNAL OF THE SOCIETY, VOL. 77:—		
535		Printing and Binding	839	18 8
245		Postage, Packing, and Delivery	245	0 0
255		Editing and Literary Contributions	225	0 0
80		Illustrations	50	0 0
1,115			£	s. d.
50		Less Sales (Vol. 76 and earlier)	1,359	18 8
185		Advertisements (Vol. 77)	54	18 8
241			225	0 0
874				279 18 8
6				1,080 0 0
180		Debit Balance from Vol. 76		
—		Excess expenditure in production of Vol. 76		120 0 0
35		PAMPHLETS:—		
		Printing, &c.		32 18 9
710		LABORATORY:—		
		Salary and Petty Cash		710 18 8
		OTHER SCIENTIFIC DEPARTMENTS:—		
250		Botanist's Salary	250	0 0
200		Zoologist's Salary	200	0 0
—		Consulting Engineer	52	10 0
400		Grant to Royal Veterinary College	400	0 0
2		Medals for Proficiency in Cattle Pathology	2	6 6
852				904 16 8
		NATIONAL DIPLOMA IN AGRICULTURE:—		
152		Honoraria and Expenses of Examiners	130	4 8
46		Travelling Expenses of Officials	45	3 0
37		Hotel Expenses of Examiners and Officials	29	4 9
35		Printing, Stationery, and Postage	28	2 1
13		Writing Diplomas	2	5 0
74		Salaries for Assistants	74	10 0
357			309	8 1
223		Less Entry Fees and Sales of Examination Papers	86	18 0
134			323	11 1
67		Less Highland and Agricultural Society's Moiety	111	5 6
67				111 5 7
		NATIONAL DIPLOMA IN DAIRYING:—		
23		Hire of Premises, &c.	10	10 0
58		Fees to Examiners	43	7 8
36		Hotel and Travelling Expenses	20	18 0
3		Printing and Postage	7	18 9
120			81	12 2
44		Less Entry Fees and Sales of Examination Papers	40	18 8
76				40 18 6
		EXTRA EXPENDITURE:—		
150		Contribution towards Woburn Farm	150	0 0
74		Hills' Bequest:—Contribution for current year	51	9 0
—		Donation to Road Transport Association	5	5 0
				206 14 0
106		Printing Index to Journal		
921		Conversion of Consols		
1,000		Contribution to National Relief Fund		
1,000		Contribution to Agricultural Relief of Allies Fund		
3,251				2,800 0 0
2,500		CONTRIBUTION TO SHOW FUND		9,166 18 5
—				850 18 9
£11,698		CREDIT BALANCE CARRIED TO BALANCE SHEET		£10,617 18 2

Examined, audited, and found correct, this 8th day of February, 1917.

JONAS M. WEBB,
HUBERT J. GREENWOOD, } Auditors on behalf of the Society.
NEWELL P. SQUARRY,

xiv STATEMENT OF RECEIPTS AND EXPENDI- JUNE 27 TO

Corresponding figures for 1915.	Receipts.		£ s. d.		£ s. d.	
6	Subscription from Corporation of Manchester				2,000	0 0
2,000	Prizes given by Agricultural and Breed Societies	2,040	8 6			
2,282	Prizes given by Manchester Local Committee	1,475	15 0		3,525	3 6
—	Contributions from Manchester Local Committee towards cost of Fencing to Showground	750	0 0			
742	Admission Tickets for Royal Lancashire Agricultural Society	761	5 0		1,511	5 0
	FEES FOR ENTRY OF IMPLEMENTS:—					
5,076	Implement Exhibitors' Payments for Shedding	3,294	0 6			
95	Non-Members' Fees for Entry of Implements	40	0 0			
46	Fees for Entry of "New Implements"	22	0 0			
5,217					3,365	0 6
	FEES FOR ENTRY OF LIVE STOCK:—					
2,116	By 2,066 Members' Entries @ 11.	2,066	0 0			
7	10 Substituted Entries @ 5s.	2	10 0			
276	By 100 Non-Members' Entries @ 21.	218	0 0			
503	Horse Boxes (368 @ 11; 41 @ 21.)	450	0 0			
26	371 Entries @ 10s.	185	10 0			
57	44 Entries @ 5s.	11	0 0			
—	51 Entries @ 2s. 6d.	6	7 6			
2,986					2,939	7 6
	FEES FOR ENTRY OF POULTRY:—					
26	By Members:—380 Entries @ 2s. 6d.	47	10 0			
188	By Non-Members:—1,136 Entries @ 3s. 6d.	198	16 0			
214					245	6 0
	OTHER ENTRY FEES:—					
55	Produce	72	12 0			
73	Horse-jumping Competitions	50	0 0			
46	Farm Prize Competitions	—				
174					131	12 0
	CATALOGUE:—					
22	Extra Lines for Particulars of Implements	2	s. d.			
	Exhibits	1	2 0			
2	Woodcuts of "New Implements"	1	0 0			
270	Advertising in Catalogue	408	10 3			
16	Sales of Implement Section of Catalogue	13	1 6			
533	Sales of Combined Catalogue	675	6 7			
13	Sales of Jumping Programme	6	10 0			
856					1,185	10 4
39	Less Commission on Sales	35	18 8			
817					1,129	11 8
	MISCELLANEOUS RECEIPTS:—					
357	Admission to Flower Show	799	18 8			
138	Garage	97	7 10			
11	Admission to Dog Show (25 % of net takings)	20	16 5			
75	Premium for Supply of Refreshments	75	0 0			
98	Rent for Railway Offices	89	1 8			
60	Premium for Cloak Rooms	60	0 0			
30	Rent for Board of Agriculture Pavilion	30	0 0			
111	Advertisements in Stock Prize Sheet	113	10 0			
6	Advertisements in Showyard	4	10 0			
25	Miscellaneous	22	9 9			
911					1,312	13 11
£15,241	Carried forward				£16,161	0 1

TURE OF THE SHOW AT MANCHESTER,

JULY 1, 1916.

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Corresponding figures for 1915.

Expenditure.

		£ s. d.	£ s. d.
COST OF ERECTION OF SHOWYARD:—			
1,430 {	Transferring Society's Permanent Buildings from Nottingham to Manchester (including taking down and re-erecting)	1,583	13 5
508	Fencing round Showyard	840	19 5
1,123	Implement Shedding	924	3 6
2,590	Stock Shedding	2,532	7 10
302	Poultry and Produce Sheds	328	2 8
277	Dairy	322	14 7
51	Fodder Shed and Office	66	11 0
374	Grand Stand and Large Ring	413	9 2
544	Various Offices and Stands	780	10 11
400	Painting Signs and fixing do., Fencing and Judging Rings	491	3 11
35	Insurance	42	9 6
19	Ironmongery	16	15 4
902	Hire of Canvas	781	3 6
749	General Labour and Horse Hire (including Society's Clerk of Works)	568	0 8
9,310		9,472	5 5
40	Less 80 Flag Poles at 10s.	40	0 0
9,270		9,432	5 5
SURVEYOR:—			
430	Salary, 300L.; Assistant Surveyor's Salary, 100L.; Travelling Expenses to London, 33L. 16s.; Petty Cash, 6L. 10s. 7d.	445	6 7
PRINTING:—			
603 {	Printing of Prize Sheets, Entry Forms, Admission Orders, Circulars to Exhibitors, Prize Cards, Tickets, and Miscellaneous	700	10 1
57	Programmes for Members	53	9 3
14	Plans of Showyard	38	15 5
596	Printing of Catalogues	780	2 10
71	Binding of Catalogues	78	14 8
35	Carriage of Catalogues	46	1 5
76	Printing Awards	178	15 8
23	Programmes of Jumping Competitions	23	5 2
1,478		1,898	14 3
ADVERTISING:—			
94	Advertising Closing of Entries in Newspapers	121	9 3
182	Advertising Show in Newspapers	282	15 3
563	Bill Posting	609	10 1
235	Printing of Posters, &c.	319	19 10
35	Press Agent	—	—
50	Press Visit	32	1 5
1,159		1,425	15 10
POSTAGE, CARRIAGE, &C:—			
88	General Postage	106	18 5
40	Postage of Budgets to Members	34	14 0
11	Carriage of Luggage	6	14 4
139		146	6 9
8,409 {	AMOUNT OF PRIZES AWARDED, including 3,525L. 3s. 6d. given by various Societies and Manchester Local Committee	8,285	0 0
COST OF FORAGE FOR LIVE STOCK:—			
851 {	Hay, 383L. 12s. 4d.; Straw, 404L. 5s. 9d.; Green Food, 153L. 5s. 8d.; Labour, 50L. 14s. 2d.; Insurance, 2L. 10s.; Carriage, 49L. 8s. 6d.; Miscellaneous, 6L. 17s. 8d.	1,039	8 8
80	Less Sales	35	11 3
774		1,009	17 5
JUDGES' FEES AND EXPENSES:—			
480 {	Judges of Miscellaneous Implements, 14L. 2s. 2d.; Horses, 77L. 8s. 10d.; Cattle, 131L. 8s. 10d.; Sheep, 141L. 15s. 8d.; Pigs, 24L. 19s. 8d.; Goats, 6L. 13s. 11d.; Poultry, 23L. 16s. 6d.; Produce, 60L. 10s. 11d.; Luncheons, 38L. 10s.	523	6 6
38	Badges for Judges and other Officials	38	19 1
58	Rosettes	35	2 11
568		596	17 8
568	Carried forward	596	17 8

568,226

STATEMENT OF RECEIPTS AND EXPENDITURE

Correspond-
ing figures
for 1915

Receipts (contd.).

		£	s.	d.	£	s.	d.
15,241	Brought forward				16,161	0	1
	ADMISSIONS TO SHOWYARD:—						
401	Tuesday, June 27, @ 5s.	1,014	0	6			
1,517	Wednesday, June 28, @ 2s. 6d.	3,612	9	8			
2,582	Thursday, June 29, @ 2s. 6d.	4,573	19	8			
1,303	Friday, June 30, @ 1s.	2,008	0	1			
1,631	Saturday, July 1, @ 1s.	1,840	15	0			
144	Season Tickets	238	8	3			
21	Day Tickets	130	4	3			
7,607					13,418	6	5
	ENTRANCES TO HORSE RING:—						
125	Wednesday, June 28	286	0	0			
160	Thursday, June 29	287	0	0			
100	Friday, June 30	164	1	0			
74	Saturday, July 1	155	14	0			
113	Tickets sold for Reserved Enclosure	340	0	11			
572					1,226	1	11
	SALES:—						
149	Sales of Produce at Dairy				163	16	7
242	Auction Sales in Showyard (Share of Commission)				307	15	7
23,811					31,197	0	7

= 945

Debit Balance

£25,756

£31,197 0 7

Examined, audited, and found correct, this 23rd day of November, 1916.

THOMAS MCBOW, Secretary.
WELTON, JONES & CO., Accountants.JONAS M. WEBB,
H. J. GREENWOOD, } Auditors on
behalf of
the Society.

Corresponding
figures
for 1915.

22,226

Expenditure (contd.).

£ s. d. £ s. d.
23,209 14 9

Brought forward

GENERAL ADMINISTRATION:—

Stewards:—Personal and Railway Expenses

97 15 7

Assistant Stewards:—Personal and Railway Expenses

95 10 7

Official Staff:—Extra Clerks, 111. 15s. 7d.; Lodgings, 23s.

15s. 6d.; Maintenance of Clerks, 39l. 19s. 2d.; Travelling

Expenses, 12l. 5s. 8d.; Secretary's Hotel and Travelling

Expenses, 77l. 6s. 9d.

264 19 8

Finance Office:—Finance Clerks, 18l. 16s. 3d.; Grand Stand

Men, 37l. 8s. 8d.; Turnstile Men, 44l. 15s.; Bank Clerks

32l. 19s. 0d.

123 16 6

Awards Office:—Clerks, 25l. 14s. 6d.; Awards Boys, 15l. 5s.

40 19 6

General Management:—

Foreman and Assistant Foremen

101 11 4

Yardmen and Foddermen

56 8 2

Door and Gate Keepers

68 4 1

Veterinary Department:—Veterinary Inspectors

86 12 6

Engineering Department:—Consulting Engineer 33l. 14s. 11d.;

House and Maintenance, 6l. 18s. 7d.

40 11 6

Police, &c.:—Metropolitan Police, 556l. 8s. 10d.; Commis-

sionaires, 18l. 0s. 6d.

574 18 4

Dairy:—Staff, 139l. 7s. 1d.; Milk, 63l. 6s. 3d.; Ice, 11l. 5s.

Utensils, 62l. 5s.; Salt, 3l. 12s.; Engine, 7l. 19s. 8d.; Butter

Tests, 27l. 8s. 11d.; Purchase of Cheese, 6l. 8s. 4d.; Lodgings,

9l. 14s. 7d.; Carriage, 12l. 0s. 6d.; Butter and Cheese Boxes,

3l. 11s. 3d.; Milk Analysis, 21l. 15s. 2d.; Refreshments,

13l. 17s. 7d.; Labour, 10l. 19s. 6d.; Fuel, 1l. 4s. 7d.; Mis-

cellaneous, 13l. 11s. 0d.

419 6 5

Analysis of Oiler

14 18 4

Poultry:—Superintendent and Assistants, 15l. 11s. 8d.; Pen-

ning and Feeding, 23l. 18s. 8d.; Labour, 12l. 8s. 7d.;

Carriage, 8l. 4s. 4d.; Baskets, 4l. 19s.

70 2 3

Farm Prize Competition

Flavour Show:—Hire of Tents, 256l. 14s. 3d.; Judges, 15l. 17s. 9d.;

Wages, 71l. 18s. 1d.; Medals, 26l. 0s. 4d.; Printing, 30l.;

Advertising, 7s.; Carriage, 11l. 13s. 10d.; Special Floral

Exhibits, 13l. 2s. 4d.; Fencing, &c., 15l. 2s. 1d.

(For Admissions see Miscellaneous Receipts.)

504 7 0

GENERAL SHOWYARD EXPENSES:—

Band

215 0 0

Ambulance

40 0 0

Telephone Extension

25 5 0

Telegraph Extension

—

Hire of Chairs

43 15 0

Plans of Showyard

4 12 6

Hire of Furniture

85 0 0

Billposting in Showyard

18 18 5

Medals

18 0 3

Hire of Scales

4 0 0

Hire of Turnstiles

4 19 7

Folder

2 17 9

Official Luncheon

3 2 8

Tons

3 10 1

Fuel

—

Sleepers

12 3 1

Hire of Weighbridge

20 8 6

Gas

11 18 10

Fencing

43 9 2

Miscellaneous

—

ENTERTAINMENT TAX:—

(Grand Stand (Reserved)

23 15 4

Grand Stand (Unreserved)

101 14 8

Flower Show

133 6 4

Dog Show

84 5 1

Members attending Show

90 4 0

Extra Expenditure

Outstanding Account from Nottingham Show

15 9 1

Credit Balance

26,715 1 5

23,209 14 9

23,209 14 9

Actual profit on the Manchester Show

£4,496 19 1

Add:—Contribution from the Ordinary Account to Show Fund.

2,500 0 0

23,209 14 9

23,209 14 9

23,209 14 9

23,209 14 9

23,209 14 9

23,209 14 9

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23,209 14 9

23,209 14 9

23,209 14 9

MANCHESTER SHOW, 1916.

Statement showing the distribution of the Prizes awarded in the several sections of the Manchester Show, with comparative figures of the Nottingham Show, 1915.

Corresponding figures for 1915.			STATEMENT OF PRIZES AWARDED. -		
£	s.	d.		£	s. d.
2,020	0	0	Horses	2,211	10 0
2,335	10	0	Cattle	2,409	10 0
1,723	10	0	Sheep	1,711	10 0
—			Goats	65	0 0
720	15	0	Pigs	690	15 0
419	0	0	Poultry	450	0 0
113	0	0	Cheese and Butter	221	0 0
36	0	0	Bacon and Hams	74	0 0
47	0	0	Older and Perry	27	0 0
108	0	0	Wool	99	0 0
17	0	0	Bottled Fruit	28	0 0
625	0	0	Farms	—	
199	0	0	Flower Show	202	0 0
—			Contribution to Bee Department	20	0 0
15	10	0	Farmers' Milk Competition	15	15 0
8,409	5	0		8,258	0 0
2,181	12	6	Less :—Prizes given by various Societies, &c.	2,019	8 6
			Prizes given by Manchester Local Committee	1,475	15 0
				3,525	3 6
5,227	12	6		4,732	16 6

AAA

[Copies of the full Report of any of the Council Meetings held during the year 1916 may be obtained on application to the Secretary, at 16 Bedford Square, London, W.C.]

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

Minutes of the Council.

WEDNESDAY, JANUARY 26, 1916.

The Duke of RICHMOND AND GORDON, K.G. (President), in the Chair.

Present:—Trustees.—Sir J. B. Bowen-Jones, Bart., Sir Gilbert Greenall, Bart., C.V.O., Lord Moreton, the Earl of Northbrook, the Hon. C. T. Parker, Sir John H. Thorold, Bart.

Vice-Presidents.—Mr. C. Adeane, Mr. Percy Crutchley, Mr. J. Marshall Dugdale, the Right Hon. Sir A. E. Fellowes, K.C.V.O., Mr. R. M. Greaves, Mr. Ernest Mathews, the Earl of Yarborough.

Other Members of the Council.—Mr. T. L. Aveling, Mr. H. Dent Brocklehurst, Mr. Davis Brown, Mr. Richardson Carr, Mr. W. W. Chapman, the Hon. J. E. Cross, Sir Howard Frank, Mr. W. T. Garne, Mr. Joseph Harris, Mr. R. W. Hobbs, Mr. J. Howard Howard, Mr. W. F. Ingram, Sir Charles V. Knightley, Bart., Mr. W. A. May, Mr. G. Norris Midwood, Mr. T. H. Miller, Mr. W. Nocton, Capt. R. Oliver-Bullasis, Mr. Henry Overman, Mr. A. W. Perkin, Mr. H. F. Plumptre, Lord Ranksborough, C.V.O., C.B., Mr. J. E. Rawlence, Mr. F. Reynard, Mr. C. C. Rogers, Mr. Fred Smith, Capt. J. Bell White, and Col. C. W. Wilson.

Governor.—Mr. F. Hamlyn Price.

The minutes of the last monthly meeting of the Council, held on December 8, 1915, were taken as read and approved.

Sir William B. Savory, Bart., of Stoke Poges, and Mr. George Hayhurst, representing the Co-operative Wholesale Society, Ltd., Manchester, were elected as Governors, and 26 duly nominated candidates were admitted into the Society as Members.

The Duke of RICHMOND AND GORDON, in occupying the chair for the first time, took the opportunity to thank the Council for the honour they had done him in appointing him their President for the ensuing year. He did not mind saying that when he had sat at the meetings of the Council and had seen the names of his predecessors on the President's Board, he had hoped that eventually it might be his lot to have his name included amongst those who had done so much for the agriculture of this country. He was afraid they had got a difficult year in front of them, but, still, it meant that they must all put a little more energy into their work. He supposed nobody realised more than he did that agriculture was the oldest and principal industry of the country, although for the moment the work of munitions perhaps held the field. With the assistance of the Council he would do his best to further the interests of the Society in every way. He felt sure that the cordial co-operation which previous Presidents had enjoyed would also be extended to him.

The PRESIDENT regretted that he had a sad duty to perform—it was to announce the death of their late colleague, the Hon. John Boscawen, which had occurred in peculiarly sad circumstances shortly after their last meeting. Although Mr. Boscawen had only been elected to the Council a little over a

year ago, he had for a considerable time been closely identified with the Society's Show, first of all, in the dairy, and later as steward of the horticultural exhibition, the success of which, in a large measure, was undoubtedly due to his efforts. He felt sure it would be the wish of the Council that he should convey, on their behalf, their condolence with the family in their bereavement.

The PRESIDENT—continuing—was sorry to say that his sad duties were not at an end. Within the last forty-eight hours they had learnt of the death of the Lord Mayor of Manchester, who on accession to his office succeeded to the chairmanship of the Manchester Local Committee, and had shown the greatest interest in the operations connected with the Manchester Show. The death of the Lord Mayor had been terribly sudden, and he felt that he would be carrying out the Council's wishes if he wrote a letter to the Town Clerk expressing the sympathy of the Council with the City of Manchester in the loss they had sustained.

Mr. ADEANE, in presenting the Report of the Finance Committee, said the Council would have heard from that Report the very generous offer of Mr. Charles Rothschild to continue the subscription of his father to the funds of the Society. He was quite sure it would be the wish of the Council that a letter of thanks should be addressed by the President to Mr. Rothschild.

Mr. GREAVES expressed the great regret of the Implement Committee that they were unable to see their way at present to carry out the trials of agricultural tractors. They were nevertheless fully alive to the great importance of this matter, but, in the present circumstances, it was practically impossible to get together a representative collection of machinery at such a trial. They had been told that many farmers were of opinion that those trials had been cancelled. He hoped, therefore, the Council would let it be known that the trials were only postponed, and that it was the intention that they should be held at the earliest possible moment.

Mr. MATHEWS, in presenting the Report of the Dairy and Produce Committee, called attention to the valuable presentation of the pedigree milk records and Dairy Shorthorn herd books from Mr. Charles Rothschild. The offer had been made through the Dairy Committee, but he thought it should have come either through the Stock Prizes Committee or the Journal and Education, particularly the latter, because the books were a source of education to anybody, containing as they did not only the full records of all the cows, but also the records of the dams of the bulls. The records had been very carefully kept, and he was sure they would be a valuable addition to the Library. He would move that a special vote of thanks be given to Mr. Charles Rothschild for this present to the Society. Lord NORTHBROOK seconded the motion, which was unanimously adopted.

Mr. FRED SMITH, referring to the remarks made by Sir Herbert Chermiside at the Annual Meeting, thought that the suggestions then put forward ought to be seriously considered by the Council. It appeared to him that these suggestions were made with the object of increasing the membership of the Society, and that was what he thought they were there for. He was of opinion that if this Society could co-operate with the County Societies it would be one way of increasing the membership. He would pass over the first three suggestions made by Sir Herbert Chermiside, but the fourth (that the Society might be placed more or less in relation to local Societies as the Jockey Club was to local race meetings) was the one way in which he thought they might derive some benefit. There was no doubt that most of the exhibitors at their County Shows also exhibited at the Royal. By being in close touch with the Secretaries of the County Societies they should be able to learn who were the exhibitors in the different classes, and also, of people settling in a neighbourhood or county. They first of all joined a County Society, and from those Secretaries they might be able to get the names of people in the districts who would join the Royal Agricultural Society. He certainly thought that the County Societies ought to be affiliated with the Royal. He thought in this way

they might derive considerable advantage. Co-operation was an important weapon, but it had not been extended to Agricultural Societies for some reason or other. It could not be taken to be the fault of the County Societies, for it was not for the lesser Society to approach the greater. He thought the proposals ought to come from the premier Society of England, and he hoped this matter would receive the consideration of the Council.

Sir JOHN THOROLD, as Chairman of the Committee of Selection, pointed out that at the meeting on the previous day these suggestions had been carefully gone into. With regard to the proposal that the Society might be placed in relation to local Societies as the Jockey Club was to the local race meetings, he was afraid they would not get much assistance from the local Societies. The body in his own county—the Lincolnshire Agricultural Society—was associated with the Royal, and some others were. The object of the County Society, however, was to keep up its own membership, and he did not think they would want to pass on any members. The Council were always open to receive suggestions, and when the Show went into a neighbourhood the County Society always joined the Royal.

The Hon. JOHN E. CROSS proposed that if Members of Council had any suggestions to put forward they should send them to the Secretary.

The PRESIDENT said the suggestions had been considered by the Selection Committee, as Sir John Thorold had stated. He understood that it was now proposed that Members of Council interested in this question should be asked to communicate with the Secretary, who would place their suggestions before the proper Committees.

Captain BELL WHITE had much pleasure in seconding the resolution.

Sir HOWARD FRANK asked that any suggestion sent in should be placed on the agenda paper.

Mr. BROCKLEHURST thought it would be useful if they could have a definition of what a "local society" was—if it was a County Society or the little society in existence all over the country. He belonged to a society which was very local, although it was nearly as old as the Royal. He was sure that it thought itself streets in front of the Royal. Whether they would take any suggestions from the Royal he thought was very doubtful. (Laughter.)

The proposition was then put to the meeting and carried.

The seal of the Society was affixed to the Agreement between the Society and the Corporation of Cardiff for the holding of the Show in that city in 1917.

WEDNESDAY, FEBRUARY 23, 1916.

The Duke of RICHMOND AND GORDON, K.G. (President), in the Chair.

Present:—Trustees.—Sir J. B. Bowen-Jones, Bart., the Earl of Coventry, Sir Gilbert Greenall, Bart., C.V.O., Lord Middleton, the Earl of Northbrook, the Hon. C. T. Parker, Sir John H. Thorold, Bart.

Vice-Presidents.—Mr. C. Adeane, Mr. Percy Crutchley, Mr. J. Marshall Dugdale, the Right Hon. Sir A. E. Fellowes, K.C.V.O., Mr. Ernest Mathews.

Other Members of the Council.—Mr. T. L. Aveling, Mr. Richardson Carr. Mr. W. W. Chapman, the Hon. J. E. Cross, Mr. J. T. C. Eadie, Mr. John Evens, Mr. J. Falconer, Sir Howard Frank, Mr. R. W. Hobbs, Sir Charles V. Knightley, Bart., Mr. William Nocton, Mr. J. L. Luddington, Mr. Alfred Mansell, Mr. C. Middleton, Mr. G. Norris Midwood, Mr. R. G. Patterson, Mr. C. M. S. Pilkington, Mr. H. F. Plumptre, Mr. G. G. Rea, Mr. F. Reynard, Mr. C. C. Rogers, Capt. P. W. Seward, Mr. Fred Smith, Lieut.-Col. E. W. Stanyforth, Lord Strachie, Capt. J. Bell White, R.N.R., and Mr. L. C. Wrigley.

Governors.—Mr. George Hayhurst, Mr. F. Hamlyn Price.

The following Members of the Manchester Local Committee were also present:—Mr. Francis Ellis and Mr. J. Herbert Hall (Local Secretary).

The PRESIDENT read the following letters, which had been received respectively from Lady Margaret Boscawen and the Town Clerk of Manchester :—

DEAR DUKE OF RICHMOND,

Thank you so very much for your letter written on behalf of yourself and the Council of the Royal Agricultural Society of England, which I have just received. May I ask you to convey my sincerest and heartfelt thanks for the kind expressions of sympathy to myself from the Council in my great sorrow. I cannot say how I appreciate the kind words you have written about my husband. I am sure all his colleagues know what an honour he considered it to be a Member of their Council, and how truly he had at heart all the best interests of the Society.

With many thanks for your own kind message,

Yours sincerely,

(Signed) MARGARET F. L. BOSCAWEN.

Town Hall, Manchester.

MY LORD DUKE,

I beg to acknowledge receipt of your letter dated the 26th instant conveying the deep sympathy of the Council of the Royal Agricultural Society of England with the Council of this City in the lamented death of the Lord Mayor of Manchester.

I will submit the letter to the City Council at its first meeting.

I have the honour to be,

My Lord Duke,

Yours faithfully,

(Signed) THOMAS HUDSON,

Town Clerk.

The minutes of the last meeting of the Council held on January 26, 1916, were taken as read and approved.

Fourteen duly nominated candidates were admitted into the Society as Members.

The Report of the Finance Committee was received and adopted, together with the Accounts for 1915 and the Estimates of Receipts and Expenditure for the present year, which were explained in detail by Mr. Adeane, Chairman of the Committee.

Sir HOWARD FRANK said that he did not think the Council would wish to pass the accounts without congratulating Mr. Adeane on the favourable position of the Society in all the circumstances. They all realised that they were passing through trying times, and the Society were fortunate in having as chairman of the Finance Committee a man who guided them through their affairs in such a satisfactory manner and whose experience had been of so much assistance. He felt that they should not pass the motion without congratulating Mr. Adeane and thanking him.

Mr. ADEANE thanked Sir Howard Frank for his kind reference. It was an encouragement to him after being for ten years more or less responsible for the finances of the Society. He owed a great deal to the co-operation of his colleagues on the Finance Committee. He was very glad that they had been able to report so satisfactorily on the finances of the Society at the present time.

The Report of the Stock Prizes Committee was received and adopted, including the following Minute on the subject of the increase of rates for the shipment of live stock :—

Having regard to the fact that breeders of pedigree stock are much prejudiced by the high freight now charged by the shipping companies for the conveyance of animals sold for export, the Committee views with concern the suggested further increase, and recommends that the Board of Agriculture be urged to take steps to prevent this increase, and so endeavour to protect the interests of live stock breeders. They desire to draw attention to the fact that the prices paid by the importers for the pedigree animals are at least treble their food value, and they are paid for in gold. The Trade and Navigation Returns show that for the last three years this country has received in payment for pedigree stock exported the following sums :—In 1913, 2,167,124l. ; in 1914, 1,277,088l. ; in 1915, 548,830l. They also further point out that the animals are in nearly all cases carried as cargo on deck, occupying space which would not otherwise be utilised, hence the whole of this freight is additional and clear profit to the shippers.

The Report also contained a recommendation that the attention of the Board of Agriculture be called to the difficulty that owners of stallions are

experiencing in making suitable arrangements for the travelling of their horses during the coming season in consequence of their men having joined the army. It is suggested that such men as are in training in this country be released for the season.

Mr. REYNARD, in presenting this Report, said he would first like to say a few words on the question of men for leading stallions. He believed this to be a very serious matter, for people who were in the habit of travelling stallions were finding great difficulty in fulfilling their rounds. He thought that if a little pressure could be brought to bear upon the War Office and the Board of Agriculture, something might be done. This not only applied to heavy horses, but to light horses, King's Premium winners, and, in a few cases, Hackneys and coach horses.

Lord MIDDLETON supported what Mr. Reynard had said with regard to stallion leaders. They all knew there was the greatest difficulty in getting these men, as so many had gone into the army. A few weeks ago he himself had been very anxious to get a man back, and wrote to the military authorities, whose reply was that any man could do the work. As the Council knew, this was not the case. A man for this work must be very honest and not too old, and they wanted one who could walk, especially for thoroughbred stallions. He referred the matter to the Board of Agriculture, and they were able to get the man sent back to him. He thought that if the general question were referred to the Board they might be able to do something.

Mr. REYNARD said that the matter of the increase of rates for shipment of stock—referred to in the Stock Prizes Committee Report—had been brought before the Council by a firm of shippers, who had already sent a protest to the Board of Trade. In the case of cattle, he might tell them that the rates had been increased from fifteen to twenty guineas, and for sheep from four to five guineas, and he believed that rates for other classes of stock had been increased in the same proportion. In addition, there was a 25 per cent. war surcharge, and 10 per cent. primage, which was returnable under certain conditions. The increase, he understood, was to take effect as from January 20. The firm in question considered the further increase unwarrantable.

Mr. ALFRED MANSELL said they all knew that unreasonable freights would restrict business, and, as far as he could see, there were no good and sufficient reasons for the increase. He had seen during the last few weeks from the accounts of some of the shipping companies the excessive profits which had been made. In one case a company with a capital of 240,000*l.* had made something like 270,000*l.* in one year. The increase of freights which had been stated applied to South America, but it was the same thing for South Africa, Australia, and other places. Recently the rate for shipment to Australia, which used to be twenty-nine guineas per head, had been increased to fifty-five guineas, which for the moderate price animal was prohibitive. In the case of the high-priced animal the increase was not such a serious matter. As a Society they should encourage the pedigree breeder to produce the best stock, and it was important that the export trade should be maintained in order that the breeder might have the best class male animal for use on his own stock. The business, as shown by the figures mentioned, was a very considerable one, and he thought they ought to do something to ensure that the cost of shipment was not increased but reduced. He could remember when the rate for shipment to the Argentine was ten guineas for cattle. At present it was twenty guineas, and, with the 25 per cent. war surcharge, it amounted to 26*l.* 5*s.* On the 50*l.* or 60*l.* animal this charge represented a considerable amount of money, for, in addition, food and attendance had to be provided. As the premier Society, he was of opinion that they should ask the Board of Agriculture to use their efforts to get these prices reduced. If the Government had done the same with shipping as they had done with the railway companies this thing would not have happened.

WEDNESDAY, MARCH 29, 1916.

The Duke of RICHMOND AND GORDON, K.G. (President), in the Chair.

Present:—Trustees.—The Earl of Coventry, Sir Gilbert Greenall, Bart., C.V.O., Lord Middleton, the Earl of Northbrook, Sir John H. Thorold, Bart.

Vice-Presidents.—Mr. C. Adeane, Mr. Percy Crutchley, the Right Hon. Sir A. E. Fellowes, K.C.V.O., Mr. Ernest Mathews, the Duke of Portland, K.G.

Other Members of the Council.—Mr. D. T. Alexander, Mr. T. L. Aveling, Mr. H. Dent Brocklehurst, Mr. Davis Brown, Mr. Richardson Carr, Mr. W. W. Chapman, Mr. John Evens, Mr. J. Falconer, Sir Howard Frank, Mr. Joseph Harris, Mr. W. Harrison, Mr. J. H. Hine, Mr. R. W. Hobbs, Mr. J. Howard Howard, Mr. W. F. Ingram, Mr. J. L. Luddington, Mr. Alfred Mansell, Mr. W. A. May, Mr. C. Middleton, Mr. G. Norris Midwood, Mr. William Nocton, Capt. R. Oliver-Bellasis, Mr. A. W. Perkin, Mr. C. M. S. Pilkington, Mr. J. E. Rawlence, Mr. F. Reynard, Capt. Percy W. Seward, Lieut.-Col. E. W. Stanyforth, Lord Strachie, and Mr. Brooking Trant.

Governor.—Mr. F. Hamlyn Price.

The following Members of the Manchester Local Committee were also present:—Mr. Francis Ellis and Mr. J. Herbert Hall (Local Secretary).

The minutes of the last meeting of the Council held on February 23, 1916, were taken as read and approved.

Major F. C. Buckley, of Bury Mount, Warstock, Warwickshire, was elected a Governor, and 26 duly nominated candidates were admitted into the Society as Members.

Mr. LUDDINGTON, in presenting the Report of the Chemical Committee, said that the primary object of the calf-rearing experiment at Woburn this winter—the first part of which had just been concluded—was to see whether not only *whole* milk, but even *separated* milk, could be dispensed with in the rearing of calves. The result had been to show that, after a fortnight's feeding on whole milk, it is quite possible to dispense with milk entirely and replace it by water, using suitable foods as meals. Of the different foods used, palm-nut meal had proved the most economical, the gain in live weight resulting from its use, along with *water*, being but little below that obtained with crushed oats and separated milk, while the cost had been considerably less. Of the other foods, the order of economical return had been: Beans, then oats, and next maize—each with *water only*, while calf meal, as in the former experiments, had given the lowest return.

Mr. MANSELL said with regard to sulphate of ammonia, referred to in the Chemical Committee's Report, that, in his opinion, the accumulation at the works could be reduced if prices were reduced. There was, he thought, a feeling amongst farmers that the present price of sulphate of ammonia was very high. At the Farmers' Club on Monday evening this matter had been discussed. He understood that something like 8*l.* per ton was about the cost, and that there was a corner holding up the price. If this were so, he thought it should not be allowed, and that they should suggest that the price be lowered. If this were done, he thought farmers would take it at the reduced price.

Mr. LUDDINGTON quite agreed, and on behalf of the Chemical Committee accepted an amendment to the Report adding an expression of opinion to that effect.

Mr. REYNARD, in presenting the Report of the Stock Prizes Committee, said with regard to the release of soldiers to act as stallion leaders, he thought it was a matter of satisfaction that the application of this Society, backed up by representations from other societies, had been acceded to, and that breeders would not be deprived of the services of leaders for their stallions.

The Report of the IMPLEMENT Committee was received, including a recommendation that a Special Committee be appointed to wait upon the Minister of Munitions to discuss questions that had arisen in connection with

the exhibition of implements and machinery at the Manchester Show, and to report to an adjourned meeting of the Council. A formal resolution to this effect was moved by Mr. CRUTCHLEY, seconded by Mr. WM. HARRISON. On the motion of Sir JOHN THOROLD, seconded by Sir GILBERT GREENALL, an amendment to the report was agreed to, giving the Special Committee power to act.

The Duke of PORTLAND, as President of the Agricultural Relief of Allies Fund, said he had been asked to bring before the notice of the Council, and of the Society generally, the following statement :—

The Publicity Committee have considered the particulars submitted as to the progress of the Fund in the various counties, and it has been noticed that there are several in which no action appears to have been taken in the interests of the Fund.

The Fund was initiated by the Society, and it might be considered a very proper thing for members of Council to interest themselves in this matter in their several counties.

The Executive Committee have endeavoured in many ways to awaken the interest of farmers and others interested in agriculture throughout the country, but apparently in some counties there is little or no knowledge of the Fund and its objects.

The Executive Committee would greatly appreciate the services of members of the Council in this particular direction. It has been suggested that in initiating this Fund the Society were merely doing their duty as representing agriculture, and it is hoped that members of Council and members generally, will take up the matter in their districts.

He could only say that, as President of the Fund he fully endorsed the statement made by the Publicity Committee, and he trusted that all members of the Society would do their utmost to support the Fund and bring it to the notice of the public in general. He thought they might congratulate themselves upon the very good progress that had been made, and also upon the generous response which their appeal had already met with. A large sum of money had been collected, and many contributions received of breeding animals, seeds, and other kinds of agricultural produce. But, still, if they were to fulfil their desire and do their duty to the Allies a far larger sum of money and other contributions would be required. He trusted that members of Council would do their best to further the interests of this Fund.

He had already addressed meetings himself in the country in support of the Fund, and this week he was going to undertake the rôle of auctioneer and sell an animal in Mansfield market-place. He had only told them that in order to show that he was ready to support anything he said by his own action. His Grace then moved the following resolution :—

"That the Council urgently appeal to the members of the Society to do their utmost to support the movement for giving assistance to the farmers in the devastated districts of the allied countries."

Mr. JOHN EVENS had very great pleasure in seconding the resolution. He thought that a strong resolution sent from the Council of this Society would certainly help those of them who were working for the cause in the country. Speaking as a farmer, he would like to say that whilst there were many excellent funds before the public, no fund appealed so strongly to everyone connected with agriculture, and if this question was keenly put before the farmers of the country, he felt sure they would rise to the occasion and do their duty.

The resolution was unanimously carried, and it was also decided that copies of it should be circulated as a leaflet to the Governors and Members of the Society.

Mr. ADRIANE, as Treasurer of the Fund, thought that the sending out of this appeal would show that the Fund was going forward, and he believed that it would have a very great effect. Financially they had not done badly. They had collected in subscriptions and received promises of over 60,000*l.*, but

when the magnitude of the undertaking was considered that was not nearly sufficient. He thought that a great many people were under the impression that the assistance that had been sent out to Serbia in the way of cash had fallen into the hands of the enemy. That was not so. The committee had been quite alive to the danger. So far back as August last they had cabled for the 1,500*l.* lodged in Serbia, and he was glad to say that it was now in a bank in London. Most of the counties were now organised, but there was still a great deal to be done. As Mr. Evens had said there were several excellent appeals throughout the country, but he ventured to say that no appeal could come home to the British farmer as did that from their suffering fellow-farmers in the devastated countries. They could not go into the towns to get money for this purpose; they must go to agriculturists themselves. He thought it would be found that in those counties where they had had most success—and there had been a good deal of success in some counties—it depended on individuals who had shown considerable energy and activity. That was why he wished to appeal to Members, through the Council, to do all they could in their own districts to forward this movement by making known the necessities of farmers abroad, and to do all they could to promote gift sales in their own counties.

WEDNESDAY, MAY 3, 1916.

The Duke of RICHMOND AND GORDON, K.G. (President), in the Chair.

Present:—Trustees.—H.R.H. Prince Christian, K.G., the Earl of Coventry, Sir Gilbert Greenall, Bart., C.V.O., the Earl of Northbrook, the Hon. C. T. Parker, Sir John H. Thorold, Bart.

Vice-Presidents.—Mr. C. Adeane, Mr. Percy Crutchley, Mr. R. M. Greaves, Mr. Ernest Mathews, the Duke of Portland, K.G.

Other Members of the Council.—Mr. T. L. Aveling, Mr. Davis Brown, Mr. W. W. Chapman, the Hon. J. E. Cross, Mr. J. T. C. Eadie, Mr. W. Harrison, Mr. A. Hiscock, Mr. R. W. Hobbs, Mr. W. F. Ingram, Sir C. V. Knightley, Bart., Mr. J. L. Luddington, Mr. Alfred Mansell, Mr. C. Middleton, Mr. G. Norris Midwood, Mr. John Myatt, Mr. William Nocton, Mr. A. W. Perkin, Mr. F. Reynard, Mr. C. C. Rogers, Mr. John Rowell, Capt. Percy W. Seward, Lieut.-Col. E. W. Stanforth, Lord Strachie, Mr. C. W. Tindall, Mr. A. P. Turner, and Mr. L. O. Wrigley.

Governor.—Mr. F. Hamlyn Price.

The following Members of the Manchester Local Committee were also present:—Mr. W. D. Bullock, Mr. Francis Ellis, and Mr. J. Herbert Hall (Local Secretary).

The minutes of the last meeting of the Council held on March 29, 1916, were taken as read and approved.

Mr. William B. M. Bird, of Earham, Chichester, and Mr. Andrew Gibson, of Woodside, Carlisle, were elected Governors; and 151 duly nominated candidates were admitted into the Society as Members.

Sir JOHN THOROLD, in moving the adoption of the report of the Journal Committee, said that there were great difficulties in producing the Journal; the cost of paper had increased, and there were still further demands on them in this respect. The Committee had decided to go on with the preparation of the next volume of the Journal as usual, but it remained for further consideration as to whether they would not have some proposals to make to the Council in the future.

The PRESIDENT said he thought that perhaps the Council would be interested to know that, subsequent to their last meeting, he, in company with some other Members, had interviewed Dr. Addison, of the Ministry of Munitions of War, not so much with regard to the extra facilities for which they asked, as for some clear statement as to what might or might not be shown in

the Implement section. He thought the Council might congratulate themselves on the cordial way in which they had been met by Dr. Addison. Some of their difficulties had undoubtedly been smoothed away, and, considering the state of affairs generally at this moment, he thought the Ministry of Munitions had gone as far as they could do in enabling the Society to carry out what was advisable and desirable in the interests of the Show.

It had been suggested to the General Manchester Committee by the Hon. J. E. Cross and Mr. G. Norris Midwood that a demonstration by women on farm work on the land should be held in the showyard; but the committee, although in full sympathy with such work, were of opinion that it would not be practicable.

Sir GILBERT GREENALL said that with regard to the suggested demonstration of women workers he should not like it to go out that the Society were not in favour of such labour. The committee did not feel that they could arrange for a demonstration *inside* the showyard; but, if the Lancashire and Cheshire people cared to arrange such a demonstration *outside* the Show ground, there would be no objection. He thought the Society might very well let their Members know that there was such a thing going on if the Lancashire and Cheshire people cared to run it.

The Hon. JOHN E. CROSS was glad to hear what Sir Gilbert Greenall had said. Perhaps it would be absolutely impracticable to run such a demonstration in the Show ground. What he wanted was a small committee formed of Members of their Lancashire and Cheshire County committees, and perhaps of the Local Committee at Manchester, to see whether it was practicable or not. If the proposal were found practicable, it should have the acquiescence, approval and support of the Society, even though the demonstration were held outside the ground. Their motto was "Practice with Science," and at a time like this, when they were suffering from shortage of labour, he thought it would be a good thing if they could demonstrate to farmers visiting the Show that women were, and could be, of real use on the land.

The PRESIDENT said he thought it should be made clear that the support of the Society was moral and not material.

Mr. G. NORRIS MIDWOOD asked if he might give the Council a message from the Manchester Local Committee respecting the fund they were raising in connection with the Show. They had asked him to explain to the Members of the Council that, although it was called a "local" fund, they would not refuse donations from any Members of that Council; in fact, they invited them.

On the motion of Mr. ADRIANE, seconded by Sir GILBERT GREENALL, the seal of the Society was ordered to be affixed to the power of attorney for the transfer of War Stock sold in connection with the Hills' Bequest Account.

WEDNESDAY, JUNE 7, 1916.

The Duke of RICHMOND AND GORDON, K.G. (President), in the Chair.

Present:—Trustees.—The Earl of Coventry, Sir Gilbert Greenall, Bart., C.V.O., the Earl of Northbrook, Sir John H. Thorold, Bart.

Vice-Presidents.—Mr. C. Adeane, Mr. Percy Crutchley, Mr. J. Marshall Dugdale, Mr. R. M. Greaves, Mr. Ernest Mathews, the Duke of Portland, K.G.

Other Members of the Council.—Mr. T. L. Aveling, Mr. H. Dent Brocklehurst, Mr. Davis Brown, Mr. W. W. Chapman, the Hon. J. E. Cross, Mr. John Evens, Sir Howard Frank, Lord Harlech, Mr. Joseph Harris, Lieut.-Col. the Hon. E. G. Henderson, M.P., Mr. A. Hiscock, Mr. R. W. Hobbs, Mr. J. Howard Howard, Mr. J. L. Luddington, Mr. C. Middleton, Mr. G. Norris Midwood, Mr. William Nocton, Capt. R. Oliver-Bellasis, Mr. H. F. Plumptre, Mr. G. G. Rea, Mr. F. Reynard, Mr. C. C. Rogers, Capt. Percy W. Seward, Lieut.-Col. E. W. Stanforth, Lord Strachie, Mr. C. W. Tindall, and Capt. J. Bell White, R.N.R.

Governor.—Mr. F. Hamlyn Price.

The following Members of the Manchester Local Committee were also present:—Mr. W. D. Bullock, Mr. Francis Ellis, and Mr. J. Herbert Hall (Local Secretary).

The minutes of the last meeting of the Council held on May 3, 1916, were taken as read and approved.

Mr. Andrew Devitt, J.P., of Herontye, East Grinstead, and the Earl of Rocksavage, Houghton, Norfolk, were elected Governors, and 243 duly nominated candidates were admitted into the Society as Members.

Before passing to the ordinary business, the PRESIDENT reported officially the death on May 2 of Mr. T. H. Miller, one of the representatives on the Council of the Division of Lancashire. Mr. Miller had first become associated with the Society as a Member in the year 1870, joining the Council in 1881. He had acted as Steward at the Annual Shows held in the late 'eighties, and had been Senior Steward on the occasion of the Windsor Meeting in 1889. He had been a regular attendant at the meetings of Committees and Council for several years. His Grace was sure there were many of his colleagues present who would bear testimony to the practical interest he took in agriculture generally, more particularly in his own county of Lancashire. Mr. Miller would always be remembered as the owner of that noted Shire stallion, Honest Tom. He felt that he would be voicing the feelings of the Council when he suggested that a letter of sympathy should be sent to Mrs. Miller.

The SECRETARY reported that the Trustees of the "Queen Victoria Gifts" Fund had decided to make a grant to the Royal Agricultural Benevolent Institution of 140*l.* for the year 1916, to be distributed as fourteen grants of 10*l.* each to the five male candidates, five married couples, and four female candidates who polled the largest number of votes in their class, and who would not this year receive grants from any other fund in connection with the Royal Agricultural Benevolent Institution.

Mr. MIDWOOD said he had been asked to report to the Council that the Local Fund now amounted to 5,700*l.* and in addition to that the Corporation were laying on the water and gas at an approximate cost of 1,500*l.* They were doing that free of charge, so that at the moment it might be said that the Local Fund was 7,200*l.* The Local Committee were aiming at beating what was done on the previous occasion, and, as Treasurer, he had every confidence in suggesting that they would do so.

Lord STRACHIE inquired whether any intimation had been given to the Council through the President or Chairman of any of the Committees as regards shortage of labour. As the Council were aware, it had been stated by Mr. Acland that there had been an actual decrease of production owing to the shortage of labour, and that it was the intention of the Board of Agriculture to issue some instructions or scale as to what men ought to be allowed to remain on the land. The production of food for the country was just as important as providing men for the front. If the Council had received no information, he thought something should be done in order that agriculturists should know their position in the matter.

Lieut.-Col. the Hon. H. G. HENDERSON stated that on behalf of the War Office he had taken part in the negotiations on this matter, and had attended meetings with the military representatives and representatives of the Board of Agriculture in every part of England and Wales. He thought he might give details of the arrangements that had been come to. It had been agreed between the War Office and the Board of Agriculture that farmers should be left:—

One able-bodied man to every team of horses, the team to be the number of horses required to plough any particular holding—a two-horse or three-horse team.

One able-bodied man to every twenty cows in milk, with the assistance of a boy or woman.

One able-bodied man to every fifty stall-fed cattle, with similar assistance.

One able-bodied man to every 200 sheep on enclosed land, exclusive of lambs.

One able-bodied man to every 800 sheep on hills.

That was the arrangement that had been come to, but he was aware that in some districts they had got below that minimum.

They had come to an agreement regarding such cases that if the Board of Agriculture made representations the matter should come before a special department of the War Office, but the War Office were very loath to release any men between the ages of nineteen and twenty-seven; those were the men most wanted. They would be prepared where application was made to release men of forty and over who might be of great use to agriculturists generally. In the early days of the war a large number of older men, some of them old soldiers and family men attracted by the separation allowances, had joined the army, and they had been away many months. Where those men were serving at home, the War Office were prepared to arrange an exchange for men between the ages of nineteen and thirty. They wanted to get these young men for service abroad.

They looked for the co-operation of agriculturists in this matter. In cases where the labour on a farm had been reduced below the minimum he had mentioned, the War Office would consider sympathetically any reports put forward by the Board of Agriculture. He would, however, like to remind the Council that they could not spare from the army men between the ages of nineteen and twenty-seven. The young men were those most wanted.

A discussion then ensued, in which Mr. CHRISTOPHER MIDDLETON, Mr. J. MARSHALL DUGDALE, Lord STRACHIE, Colonel HENDERSON, the PRESIDENT, Colonel STANYFORTH, Mr. ADEANE, Mr. ROGERS, Mr. TINDALL, and Mr. HOBBS took part.

The following resolution was passed, on the motion of Lord STRACHIE, seconded by Mr. DUGDALE:—

"That the Local Government Board be requested at once to issue their new promised circular in regard to exemption of agricultural labourers in accordance with the agreement come to by the Board of Agriculture and the War Office."

WEDNESDAY, JUNE 28, 1916.

At a Monthly Council, held in the Manchester Showyard, the Duke of RICHMOND and GORDON, K.G. (President) in the Chair.

Present:—Trustees.—Lord Middleton, the Earl of Northbrook, Sir John H. Thorold, Bart.

Vice-Presidents.—Mr. C. Adeane, Mr. Percy Crutchley, Mr. J. Marshall Dugdale, Mr. R. M. Greaves, Mr. Ernest Mathews.

Other Members of Council.—Mr. H. Dent Brocklehurst, Mr. Davis Brown, Mr. Thomas A. Buttar, Mr. W. W. Chapman, the Hon. John E. Cross, Mr. J. T. C. Eadie, Mr. James Falconer, Mr. Joseph Harris, Mr. William Harrison, Mr. J. H. Hine, Mr. Arthur Hiscock, Mr. J. Howard Howard, Mr. J. L. Luddington, Mr. Christopher Middleton, Mr. G. Norris Midwood, Mr. John Myatt, Mr. William Nocton, Mr. R. G. Patterson, Mr. A. W. Perkin, Mr. G. G. Rea, Mr. Frederick Reynard, Mr. C. Coltman Rogers, Lieut.-Col. E. W. Stanyforth, Mr. C. W. Tindall, Mr. A. P. Turner, Col. C. W. Wilson, &c.

The Minutes of the last Monthly Meeting of the Council held at 16 Bedford Square, London, W.C., on Wednesday, June 7, 1916, were taken as read and approved.

It was resolved, on the motion of the PRESIDENT "That the best thanks of the Society are due and are hereby tendered to:—

1. The Officials of the General Post Office for the efficient postal arrangements.
2. The Chief Commissioner of Police for the efficient services rendered by the detachment of Metropolitan Police on duty in the Showyard.

3. The Chief Constable of Manchester for the efficient police arrangements in connection with the Show.
4. The St. John Ambulance Brigade, Manchester for the efficient Ambulance arrangements.
5. The Manchester and County Bank for the efficient services rendered by their officials.
6. Messrs. Merryweather & Sons, Ltd., for the provision of appliances and for the efficient arrangements in connection with the Fire Station in the Showyard.
7. Messrs. Dickson Brown & Tait for providing Floral Decorations."

Letters of thanks were also ordered to be sent to various other individuals and firms for assistance kindly rendered and for the loan of articles for the purposes of the Show.

Mr. C. W. TINDALL called attention to the announcement of the Government's intention to commandeer the whole of this year's clip of wool. He considered the position to be unsatisfactory and the demands on agriculturists unreasonable. In his opinion, the price of the wool if taken should not be less than that ruling last year. Speaking for his own county, he knew of cases in which large quantities of wool of this year's clip had been sold, previous to the announcement by the Government, at 40s. to 41s.

After other members of Council had spoken on the subject, it was agreed that a resolution should be drawn up for submission to the General Meeting of Governors and Members to be held at noon that day.

Proceedings at General Meeting of Governors and Members,

HELD IN THE
LARGE TENT IN THE SHOWYARD AT MANCHESTER,

WEDNESDAY, JUNE 28, 1916.

THE DUKE OF RICHMOND AND GORDON, K.G. (PRESIDENT), IN THE CHAIR.

Amongst those present on the platform were the Earl of Northbrook, Lord Middleton, Sir Gilbert Greenall, Bart., C.V.O., Sir John H. Thorold, Bart., Mr. C. R. W. Adeane, Mr. Henry Dent Brocklehurst, Mr. Davis Brown, Mr. W. W. Chapman, the Hon. J. E. Cross, Mr. Percy Crutchley, Mr. J. Marshall Dugdale, Mr. John T. C. Eadie, Mr. James Falconer, Mr. R. M. Greaves, Mr. Joseph Harris, Mr. William Harrison, Mr. John Henry Hine, Mr. Arthur Hiscock, Mr. John Howard Howard, Mr. J. L. Luddington, Mr. Ernest Mathews, Mr. Christopher Middleton, Mr. John Myatt, Mr. William Nocton, Mr. R. G. Patterson, Mr. A. W. Perkin, Mr. F. Hamlyn Price, Mr. George G. Rea, Mr. Frederick Reynard, Mr. Charles Coltman Rogers, Lieut.-Col. E. W. Stanyforth, Mr. C. W. Tindall, Mr. Arthur P. Turner, Col. C. W. Wilson, &c.

The following Members of the Manchester Local Committee were in attendance:—The Lord Mayor (Mr. Alderman Smethurst), Sir Edward Holt, Bart., Sir Daniel McCabe, Mr. G. Norris Midwood (Local Honorary Treasurer), Mr. Thomas Hudson and Mr. J. Herbert Hall (Local Honorary Secretaries).

In the tent there was a large gathering of Governors and Members.

The PRESIDENT, in opening the proceedings, said: Before the few remarks I propose to make, I think it will be a matter of pleasure to those I am addressing that I am able to begin with the statement that, in consequence of representations made by the Council to His Majesty the King that the time has now arrived when the Prince of Wales should become a prominent member of our Society, His Royal Highness is quite prepared to become a Governor of this Society, and I now ask this meeting to elect him with acclamation. (Applause.)

His GRACE, proceeding, said: The conditions to-day require that some reference should be made to what is happening outside this showyard. Well, it was a matter of grave concern to the Society as to whether the Show should be held this year or not, and, of course, there was a great deal to be said on both sides, but, personally, I think that the arguments in favour of carrying on were stronger than those in favour of letting it slide. It is never a good plan in anything, when you have had a thing long established, to break the continuity of its existence, and we thought that, considering the vast interests that are concerned, and the amount of money sunk in agriculture in this country, and the opportunities that are given at a show like this for breeders to meet buyers, and generally for facilitating the operations of agriculture, we ought to make an effort to carry on this year, in spite of the terrible scenes of war that are occurring not so many hundred miles from us.

Now I think in the first place we ought to recognise the hospitality of Manchester and the material assistance that they have given to us in the Local Fund they have raised. (Applause.) Not only have they contributed largely to the Local Fund, but they have given prizes in addition, and we must realise that at a show of this magnitude, unless we can get cordial support—and it has been invariably extended to us—the success of an enterprise like this must be somewhat doubtful. We are specially grateful to Manchester for the prompt way in which they have responded to the needs of the Society. (Applause.)

I dare say it is common knowledge to all of you that some departments of the Show are weaker than in ordinary years. At one time it looked almost as if it might be necessary to postpone it, but, owing to the exertions of some of these gentlemen around me, we had interviews with the authorities in London, and, although the Show has been shorn of a good deal of what is always an interesting part of our exhibits—namely, the machinery in motion—still we have been able to arrive at certain regulations which have been laid down, and which, I think, have not materially interfered with the success to-day.

The present Lord Mayor of Manchester has been very helpful indeed. His predecessor, who unfortunately died in the course of the winter, had also been doing all he could to promote the success of the Show. An exhibition of this description cannot be got up at a moment's notice. They have been working for two years in making the arrangements. It gives us a very kindly feeling towards Manchester, and, although in the ordinary course of events it will be several years before we return, we shall come back with the feeling that we have established affectionate relations that will ensure success to a future show in Manchester.

I beg to move: "That the best thanks of the Society are due, and are hereby tendered, to the Lord Mayor and Corporation of Manchester for their cordial reception of the Society." (Applause.)

Sir JOHN H. THOROLD seconded the motion, which was enthusiastically carried.

The LORD MAYOR OF MANCHESTER thanked the meeting very heartily for their acknowledgement and appreciation of what had been done. Prior to his being appointed, Mr. Alderman Copeland, who unfortunately died, had been the Local Chairman, and before him Sir Daniel McCabe. When they invited the Society to come to Manchester it was a very cordial invitation, and they extended to the members of the Society a very hearty welcome that day. When one had an honoured guest in one's home, one paid him every attention and sought to let him go away with a very happy and comfortable feeling. That was the way they in Manchester regarded the Royal Agricultural Society. When the Society resolved to visit the city, the Corporation were determined to do what they could to assist the Show, and, had it not been for this unfortunate war, they would have been able to assist in a more substantial way than they had done. Although Manchester was primarily a commercial city, they recognised that they were closely identified with the agricultural community, in so

far as they depended so much upon the farmer for supplies. The Royal Society had such an honourable record that it had been a great pleasure to the Corporation to welcome the Royal to Manchester. Their city had a reputation to maintain in connection with the Society. From a financial point of view the former shows held there under the auspices of the Royal had been eminently successful, and they were accordingly determined to maintain that reputation. (Applause.) Had it not been for this unfortunate war, and given favourable weather, he had very little doubt that Manchester would have established another excellent record that week. (Applause.) He could only assure them that they welcomed them very heartily to Manchester, and he hoped the Show would be a great success. (Applause.)

The Earl of NORTHBROOK had very great pleasure in moving: "That the best thanks of the Society are due, and are hereby tendered, to the Manchester Local Committee for their exertions to promote the success of the Show." He was sure they would all agree that these were not mere words, but that they were all deeply grateful to the members of the Local Committee for their great exertions, and for the success that had attended their efforts on this occasion. (Applause.) He wished to associate with the resolution the names of the Lord Mayor, who had been good enough to act as Chairman of the Local Committee, of Sir Edward Holt and Sir Daniel McCabe, and the other gentlemen, including his friend and fellow-member of Council, Mr. Norris Midwood. (Applause.) To no one were their thanks more heartily due than to Mr. Midwood. (Renewed applause.) He also desired to associate with the resolution the names of the Honorary Local Secretaries, Mr. Thomas Hudson and Mr. J. Herbert Hall. (Loud applause.)

Mr. PERCY CRUTCHLEY seconded the vote, which was unanimously accorded.

Sir EDWARD HOLT, in acknowledging the vote of thanks, said that when it was first mooted that the Show was coming to Manchester the members of the Local Committee made up their minds to carry out the arrangements in as efficient a manner as possible. Although the city of Manchester was the centre of an enormous manufacturing population, still they felt that their connection with agriculture must be continued and strengthened. The members of the Local Committee had no doubt in their minds that the Show should be held this year. They could see no reason why there should be a break in the continuity. In his judgment the enormous magnitude of the agricultural interests represented by the Royal Society demanded that the Show should be continued. His Grace had referred to the affectionate relations which had been established between the Society and the city, and he hoped that the time was not far distant when the Show would come to Manchester again. When they remembered that the largest manufacturing population in the kingdom was to be found around Manchester, the promoters of the Royal would see that it was desirable not only from an agricultural but from a financial point of view that the Show should again visit the city. No Society could continue very long without adequate resources, and if another record were established their financial obligations would be considerably lessened. (Applause.)

Mr. WILLIAM HARRISON proposed: "That the best thanks of the Society be tendered to the Railway Executive Committee and the various companies for the facilities afforded in connection with the Show." The railway companies, he said, had many difficulties to contend with at the present time owing to the transport of munitions, and the Society were grateful to them for the excellent service they had rendered in delivering safely and well all the stock and agricultural machinery. Notwithstanding the disadvantages under which the railway companies were working at present there was nothing of which to complain. (Hear, hear, and applause.)

Mr. G. G. REA, in seconding, said the Society was deeply indebted to the various railway companies for the excellent way they had carried out their duties. (Applause.)

The PRESIDENT having inquired if any Governor or Member had any remark to make or suggestion to offer,

Mr. C. W. TINDALL said he wished to move a resolution on a matter which he knew was exercising the minds of all agriculturists. It was on the question of the position in which they found themselves with reference to wool in consequence of the action of the Government. Those present might or might not have seen in the papers that morning an answer to a question in Parliament. If he had read it aright, the position could not possibly be satisfactory or fair to the agriculturists of the country. What it amounted to was that they were asked to accept, more or less, $3\frac{1}{2}$ d. per lb. less than they received for their wool last year. What they were and should be prepared to agree to was that the wool should, at all events, not be taken at a less price than they received last year. (Hear, hear.) He would only mention one point in justification of what he had said. Speaking for his own county (Lincolnshire), he held in his hand statements regarding cases where a large amount of wool, mostly this year's clip, had been sold previous to June 8, when the announcement was made, and the prices varied from 40s. to 44s. He had heard that wool had been sold this year up to 47s., but he did not wish to go beyond the statement that 44s. was the highest price in transactions in which he had the actual names of seller and purchaser. He thought it only fair that Members should know that this matter had been before the Council that morning, and that they regarded it as very serious. The terms of the resolution he wished to propose were as follows:—"That this meeting, while desirous of doing everything in its power to aid the Government securing all necessary supplies, would call their attention to the injustice to farmers entailed in the order prohibiting the sale of the 1916 clip of wool unless such prices are fixed as shall not be less than those ruling last year; they would further urge the prompt disclosure of the Government's intentions as to price and delivery, and that arrangements should at once be made to secure immediate payment."

Mr. R. G. PATTERSON, who seconded the resolution, said he was glad that the Council were carefully watching the interests of tenant-farmers. This matter had been very fully discussed at the Council meeting that morning, and the resolution proposed was the outcome of that discussion. As regards the price, there had been various announcements in the newspapers which might or might not have some foundation, but he did not think they ought to take them as definite pronouncements at all. He was rather inclined to think they were feelers thrown out to ascertain the opinions of farmers. It was treating farmers most unfairly to ask them to accept prices for their produce very much less than it would have made in the open market. It was unfair that farmers should be asked to be patriotic at the expense of their pockets when they were practically the only class to which this request was made, and there was no attempt to compel those who supplied the farmers with their necessities to take one farthing less. (Hear, hear.) He spoke not only for his own county (Staffordshire), but for many other counties, especially those where the farmers depend largely on the returns from their clip for payment of their midsummer rents and trade accounts. This year especially there was need for the farmers to have the money at their disposal, because those of them who had had to stock their farms had had to do so at very much higher prices than they had ever been required to pay before, with the result that they had less capital available than in ordinary circumstances. Whatever arrangements were made, it was urgently necessary that there should be prompt payment to those whose wool was taken delivery of or was "held up" at the farms, to enable them to fulfil their obligations.

Mr. W. H. BRADWELL (Nottingham), speaking as an auctioneer and a farmer, said he was very much interested in this matter. He had recently had the privilege of introducing a deputation of auctioneers to the Director of Army Contracts on this very question, and they as auctioneers claimed that they had the machinery in motion for securing the wool from the farmers.

The deputation had been sympathetically received. He had asked if the Government was going to take the whole clip, or to treat the farmers as they had done in the case of hay. The deputation was assured that the whole clip would be taken, with small exception. The great point, however, for the farmers was what price the Government was going to pay them. He considered it only fair that the Government should give a 10 per cent. rise on last year's prices. Colonial wool was making 25 per cent. more than last year, and he did not see why the English farmers should not also have some benefit. They did not want to handicap the Government. If they needed the wool, it was perfectly right that they should have it. All the farmers required was a fair price. The deputation also suggested that when the representative of the Government went round 75 per cent. of the purchase-money should be paid down immediately, as the smaller farmers—and, in fact, the larger farmers as well—were looking forward to the sale of their wool to help them to meet their rents. If the Government were going to send a man round to grade the wool it would take them ten years to buy this clip. (Laughter.) As auctioneers they had got the machinery in motion, and they would be only too glad to help in any way they could.

The PRESIDENT suggested, as an amendment to the resolution, the addition of the words "and that this resolution be communicated to the Government without delay." They wanted to know exactly where they were. He had listened with every sympathy to the remarks that had been made. As an owner of sheep with a considerable clip of wool—and he might say, incidentally, that he thought the breed was second to none—(hear, hear)—he thought there was one point that had not been touched upon, viz., the question of the storage of the wool. He was practical farmer enough to know that if it were not stored in a proper place it would very soon deteriorate. With all the difficulties facing them, they wanted to put farmers in as favourable a position as possible to make something to pay their rent and have a little to go on with. As a tenant-farmer—he paid the rent to himself (laughter)—he was looking forward to this money. It was a part of his stock-in-trade, and he looked upon himself in his farming as one out to try and carry through a profitable business. That was what, he thought, they all did, and most of them succeeded.

Mr. ELDRED WALKER, speaking as a small farmer in Somerset, said he could not breed, but had to buy in sheep and graze them. He was likely to suffer by the proposal of the Government. The price should be not last year's, but this year's; at any rate, it should be at least 10 per cent. on last year's prices.

The PRESIDENT thought this might be left to the Council.

Mr. WALKER: That resolution is going to the Government.

The PRESIDENT said they did not wish to bind the Government. It was a general expression of opinion of what the Society wanted done. No doubt cases such as that of Mr. Walker's would receive special consideration.

Mr. PREECE supported Mr. Walker. He asked if the resolution might not be slightly altered and the price fixed at not less than 10 per cent. on last year.

The PRESIDENT: If you put that in the resolution, might that not tie our hands too much? Naturally we should suffer if the Government contemplate offering us better terms. I want to keep it as wide open as I can.

The resolution proposed by Mr. TINDALL, and seconded by Mr. PATTERSON, was then passed with the addition suggested by the PRESIDENT.

The SECRETARY read extracts from the report on the competition open to farmers supplying milk daily from the counties of Lancashire and Cheshire to Manchester, Salford, or anywhere within a radius of four miles of the Manchester Town Hall. The awards were announced as below:—

Class 1.—Farmers sending to Manchester 31 gallons of milk and upwards in two deliveries, morning and evening.

1st prize of 6l. 6s. to John Clarkson, Blakeley Farm, Mobblerley.

2nd prize of 37. 3s. to Josiah Walkden, Sunny Bank Farm, Mobberley.

Certificates of Merit:—Thomas, Antwis, John James Bailey, Samuel Bargh, Edmund S. Bauley, Alfred J. Baxford, Herbert Beech, William Booth, Joseph Brindley, William Brooke, John Cullwood, James Cooper, John Darlington, J. F. Dean, Ernest Dooley, B. Dugdale & Son, James Faulkner, Peter Frith, S. J. Hague, Henry Hocknell, John T. Hocknell, William Hocknell, John R. Lowe, Thomas Massey, Isaac W. Mayer, W. H. Mayer, Edward Melling, Joseph Ollier, G. & W. Parker, John Payne, Randolph W. Platt, John Ravenscroft, Joseph Robinson, Ralph Seed, Fred. Steel, John J. Sproston, George Stamer, John Stanier, C. W. Tomkinson, William Venable, Frank T. Walley, Harry Wallworth, John T. Webb, Thomas Wilkinson, Albert N. Willis.

Class 2.—Farmer, sending to Manchester 15 to 30 gallons of milk in two deliveries, morning and evening.

1st prize of 47. 4s. to Albert Lomas, Breck Head, Brownside, Stockport.

2nd prize of 27. 2s. to John G. Sherwin, Vale Farm, Tabley, Knutsford.

Certificates of Merit:—Richard Foster, William Hudson, George Parker, F. R. Rowland, John E. Starkey, E. & P. Wild.

Mr. T. NEWBITT (Cambridge) spoke at some length on a more extensive question than the wool. He desired to call attention to what he described as the drastic and despotic action of the Government in commandeering farm produce. Labour was so depleted that it was almost impossible to grow anything. Thousands of acres, he said, had gone out of cultivation and would probably for years be growing weeds. He wished to move the following resolution:—"That the Royal Agricultural Society recommend the different agricultural societies in the United Kingdom should form small committees to bring before the Government the necessity of dealing fairly with the British farming interest in commandeering the produce, and expressing the view that fair prices should be given for all such produce."

On being put to the meeting this resolution was negated by a large majority.

Sir DANIEL MCCABE proposed a vote of thanks to the Duke of Richmond for his services in the chair. Their best thanks were due to his Grace for his presence there that day, and for the manner in which he had conducted the meeting. They hoped this Show, of which his Grace was President, would be a great success. He was very pleased to hear about the farmers' milk competition, and to learn that in such a populous centre as Manchester they had so good a supply of pure milk.

Mr. R. NEVILLE (GARNVILLE (Glastonbury), in seconding, said they must not forget that it was one of his Grace's ancestors who was the founder of the Royal Agricultural Society. He (the speaker) had sat for many years on the Council with the Duke's father, to whom all the Members looked up with veneration and respect. He had been at school with his Grace, but they had not since met until then. They all knew that he clipped the best wool in the country (laughter); long might he do so, and might his family prosper and do their duty towards the old Society. (Applause.)

The PRESIDENT, in acknowledging the expression of thanks, said it was a matter for regret that His Majesty the King was unable to attend the Show. If by any possibility he could have been present he would have come to Manchester, for His Majesty did all he could in the interests of the Royal. (Applause.) They ought to remember, too, it was owing to the kindness of the neighbouring landowner, Lord Egerton, that they were getting the full use of that magnificent showground. (Loud applause.) He should also like to mention that owing to the exertions of the Members of Council for Lancashire and Cheshire there had been a very considerable and valuable addition made to the Members of the Society in both those counties. He thanked the meeting once again for their vote of thanks. After all, on an occasion like that he did not feel altogether like a fish out of water. They had a number of fine pedigree stock in that show-yard, and if they looked up his pedigree he thought it would be found that he was bred in the right way to take an interest in a society like the Royal. He had been brought up on a farm, but he was not conceited enough to think that he had nothing to learn.

The proceedings then terminated.

WEDNESDAY, JULY 26, 1916.

The Duke of RICHMOND AND GORDON, K.G. (President), in the Chair.

Present:—Trustees.—Sir J. B. Bowen-Jones, Bart., the Duke of Devonshire, K.G., Sir Gilbert Greenall, Bart., C.V.O., Lord Middleton, Lord Moreton, the Earl of Northbrook, the Hon. C. T. Parker, Sir John H. Thorold, Bart.

Vice-Presidents.—Mr. C. Adeane, Mr. Percy Crutchley, Mr. R. M. Greaves, Mr. Ernest Mathews, the Duke of Portland, K.G.

Other Members of the Council.—Mr. T. L. Aveling, Mr. H. Dent Brocklehurst, Mr. W. W. Chapman, the Hon. J. E. Cross, Mr. J. T. C. Eadie, Sir Howard Frank, Lord Harlech, Mr. Joseph Harris, Mr. A. Hiscock, Mr. R. W. Hobbs, Sir Charles V. Knightley, Bart., Mr. J. L. Luddington, Mr. W. A. May, Mr. C. Middleton, Mr. G. Norris Midwood, Capt. R. Oliver-Bellasis, Lord Rankenborough, C.V.O., C.B., Mr. F. Reynard, Mr. John Rowell, Capt. Percy W. Seward, Mr. Fred Smith, Lieut.-Col. E. W. Stanyforth, Sir John O. S. Thursby, Bart., and Mr. L. C. Wrigley.

Governor.—Mr. F. Hamlyn Price.

The following members of the Manchester Local Committee were also present:—Mr. W. D. Bullock, Mr. Francis Ellis, and Mr. J. Herbert Hall (Local Secretary).

The minutes of the last meeting of the Council held in the Manchester Showyard, on Wednesday, June 28, 1916, were taken as read and approved.

The Rev. C. H. Brocklebank, of Barlow House, Cambs., and the Duke of Marlborough, K.G., Blenheim Palace, Woodstock, were elected Governors, and 257 duly nominated candidates were admitted into the Society as Members.

Since the last meeting of the Stock Prizes Committee a letter had been received from the Central Chamber of Agriculture, stating that a deputation would wait upon Mr. Forster, Financial Secretary to the War Office, on Wednesday, July 12th, on the subject of the Government regulations for the sale of wool, and asking the Society to appoint two delegates. On the invitation of the President, Mr. Patterson and Mr. Tindall had attended with the deputation. The decision of the War Office had been to increase the price of wool from 30 per cent. to 35 per cent. on 1914 prices. The Committee had discussed the question and they recommended that the following resolution be forwarded to the War Office:—

"The Council of the Royal Agricultural Society of England desire to impress upon the Government the desirability of proceeding as speedily as possible with the taking up of wool, and to point out the inconvenience the farmers of this country are suffering through their inability to realise in the usual manner and the difficulty they experience with regard to storage."

In presenting the Report of the Selection Committee which was received and adopted, Sir JOHN THOROLD referred to the death of Mr. R. G. Carden, who had represented Ireland on the Council since the year 1905.

On the motion of the PRESIDENT, seconded by Sir GILBERT GREENALL, it was unanimously resolved that the best thanks of the Society be accorded to:—

"(1) The Corporation of Manchester for planting shrubs and trees and decorating the ponds in the centre of the Manchester Showyard.

"(2) Messrs. Kendal Milne & Co., for their services in decorating and furnishing the Royal Pavilion, and for arranging for the admission of the public to the pavilion on payment of a fee, the whole of which amount has been contributed to the 'Allies' Fund.

"(3) The donors of animals, implements, &c., to gift sales in the Manchester Showyard.

"(4) Messrs. John Thornton & Co., Messrs. Alfred Mansell & Co., Mr. Daniel Bradshaw, of Manchester, and Mr. Sam. D. Walton, of Wilmslow, for their services as auctioneers in connection with the sales."

WEDNESDAY, NOVEMBER 8, 1916.

The Duke of RICHMOND AND GORDON, K.G. (President), in the Chair.

Present:—Trustees.—H R.H. Pimce Christian, K.G., Sir J. B. Bowen-Jones, Bart., the Earl of Coventry, Sir Gilbert Greenall, Bart., C.V.O., the Earl of Northbrook, the Hon. C. T. Parker, Sir John H. Thorold, Bart.

Vice-Presidents.—Mr. C. Adeane, Mr. Percy Crutchley, Mr. J. Marshall Dugdale, Mr. R. M. Greaves, Mr. Ernest Mathews, the Duke of Portland, K.G.

Other Members of the Council.—Mr. D. T. Alexander, Mr. T. L. Aveling, Mr. H. Dent Brocklehurst, Mr. T. A. Buttar, Mr. Richardson Carr, Mr. W. W. Chapman, the Hon. J. E. Cross, Mr. John Evens, Mr. W. Fitzherbert-Brockholes, Mr. Joseph Harris, Mr. W. Harrison, Mr. R. W. Hobbs, Mr. J. Howard Howard, Mr. W. F. Ingram, Sir Charles V. Knightley, Bart., Mr. J. L. Luddington, Mr. Alfred Mansell, Mr. C. Middleton, Mr. G. Norris Midwood, Mr. John Myatt, Mr. W. Nocton, Capt. R. Oliver-Bellasis, Mr. H. Overman, Mr. A. W. Perkin, Mr. G. G. Rea, Mr. F. Reynard, Mr. C. Coltman Rogers, Capt. Percy W. Seward, Mr. Fred Smith, Lieut.-Col. E. W. Stanforth, Sir John O. S. Thursby, Bart., Mr. C. W. Tindall, Mr. B. Trant, Mr. A. P. Turner, Col. E. V. V. Wheeler, and Capt. J. Bell White, R.N.R.

Governors.—Mr. W. F. Holt Beaver, Mr. F. Hamlyn Price.

The minutes of the last monthly meeting of the Council held on July 26 were taken as read and confirmed.

Mr. and Mrs. Walter Sykes, of The Drewitts, Warningld, Haywards Heath, were elected as Governors, and 50 duly nominated candidates were admitted into the Society as Members.

The PRESIDENT said he would like to draw the attention of the Council to the death since the last meeting of Mr. J. H. Hine, the representative for Devonshire, who had been an active Member of the Council since the year 1905, and he was sure that they would wish that an expression of their sympathy should be conveyed to Mrs. Hine and her family. The other matter which he regretted having to report was the death of Mr. John Sloughgrove, who was so well known to a great many as Secretary of the Shire Horse Society. He was also for a lengthy period one of the trusted members of the secretarial staff of this Society. He was sure that the Shire Horse Society would feel very acutely the loss of their Secretary, who for so many years had given his valuable services in the interests of the Shire horse, and that he was voicing the wishes of the Members of Council in suggesting that a message of sympathy should be conveyed to the Council of the Shire Horse Society.

Sir JOHN THOROLD formally moved:—

“That the name of Mr. Charles Adeane be recommended to the General Meeting for election as President for the ensuing year.”

The Council, he was sure, were very grateful to Mr. Adeane for all he had done for the Society, and he felt confident that he was well able to occupy the Presidential Chair. Sir GILBERT GREENALL seconded the motion, which was unanimously adopted.

WEDNESDAY, DECEMBER 6, 1916.

The Duke of RICHMOND AND GORDON, K.G. (President), in the Chair.

Present:—Trustees.—Sir J. B. Bowen-Jones, Bart., the Earl of Coventry, Sir Gilbert Greenall, Bart., C.V.O., Lord Middleton, Lord Moreton, the Earl of Northbrook, Sir John H. Thorold, Bart.

Vice-Presidents.—Mr. C. Adeane, Mr. Percy Crutchley, Mr. J. Marshall Dugdale, the Right Hon. Sir A. E. Fellowes, K.C.V.O., Mr. R. M. Greaves, Mr. Ernest Mathews, the Duke of Portland, K.G., the Earl of Powis.

Other Members of the Council.—Mr. D. F. Alexander, Capt Olive Behrens, Mr. H. Dent Brocklehurst, Mr. Davis Brown, Mr. T. A. Buttar, Mr. Richardson Carr, Mr. W. W. Chapman, the Hon. J. E. Cross, Mr. J. T. C. Eadie, Mr. John Evens, Mr. J. Falconer, Sir Walter Gilbey, Bart., Lord Harlech, Mr. Arthur Hiscock, Mr. R. W. Hobbs, Mr. J. Howard Howard, Mr. W. F. Ingram, Mr. J. L. Luddington, Mr. Alfred Mansell, Earl Manvers, Mr. C. Middleton, Mr. G. Norris Midwood, Mr. John Myatt, Capt. R. Oliver-Bellasis, Mr. H. Overman, Mr. F. Hamlyn Price, Mr. F. Reynard, Mr. Andrew Rogers, Mr. C. Collman Rogers, Mr. John Rowell, Mr. Fred Smith, Sir John O. S. Thursby, Bart., Mr. C. W. Tindall, Mr. B. Trant, Mr. A. P. Turner, Capt. J. Bell White, R.N.R., Col. C. W. Wilson, and the Right Hon. Frederick Wrench.

Mr. Francis Ellis and Mr. J. Herbert Hall were present as representing the Manchester Local Committee.

The following members of the General Cardiff Committee were also present:—The Lord Mayor of Cardiff (Councillor Joseph Stanfield), Sir John W. Courtis, Mr. E. Akers, Mr. Hubert Alexander, Mr. E. W. M. Corbett, (Chairman of the Cardiff Executive Committee), Mr. William Emerson, and Alderman Iltyd Thomas.

The Minutes of the last Monthly Meeting of the Council, held on November 8, 1916, were taken as read and approved.

Forty-six duly nominated candidates were admitted into the Society as Members.

The PRESIDENT said that before proceeding with the ordinary business of the Council he would like to say how much they appreciated the honour the Lord Mayor of Cardiff had done them by his presence there that day. The Council were aware, of course, that it had been decided to postpone the holding of the Cardiff Show. A great many people were under the impression that the Council were trying to force the Show on the country, and that the Government and Ministry of Munitions had stopped it. It was nothing of the sort, and he thought the Council would be interested to hear what had really taken place during the course of this year. In the first place, they had to go to the Ministry of Munitions to obtain from them information as to what facilities would be allowed for the Cardiff Show. On July 26 a deputation consisting of himself, the Duke of Portland, and Sir Gilbert Greenall saw Dr. Addison at Whitehall Gardens, and discussed the question of the holding of the 1917 Show, and after the interview he (the President) wrote to the Secretary to the effect that it had been very satisfactory, but that before finally answering, Dr. Addison had said he would have to consult the heads of departments, though, as far as he was concerned, he could not see any reason why the Show should not be held under the same conditions as at Manchester. Later on, authority was received from the Ministry of Munitions to proceed with the erection of the buildings at Cardiff. On Wednesday last Sir Gilbert Greenall and Mr. Adeane went down to Cardiff to attend a meeting of the Local Committee, at which there was present a representative of the Great Western Railway, and after hearing what everyone had to say, they came to the conclusion that it would not be possible to have the Show. He wanted the matter put right before the public so that it could not be said that the Society were pressing the holding of the Show.

The Duke of PORTLAND said he well recollected what transpired at the interview with Dr. Addison, and that they came away with the very strong opinion that there would be no objection whatever to the Show being held at Cardiff.

The Report of the Finance Committee was received and adopted, together with the accounts for the Manchester Show, as to which an explanatory statement was made by Mr. ADEANE.

The Duke of PORTLAND, in presenting the Report of the General Cardiff Committee, announced that the Lord Mayor of Cardiff had attended the meeting, and extended, on behalf of the citizens of Cardiff, a cordial invitation

to the Society to hold their first Show after the War at Cardiff. The Marquis of Bute had very kindly allowed the showyard plant which was already at Cardiff to remain on the showyard until 1918.

The LORD MAYOR OF CARDIFF said that, as Lord Mayor, it was his business to express regret that the Show at Cardiff had unfortunately to be postponed. In view of what had been said by way of explanation to the Council, it was regrettable that the Ministry of Munitions had acted in the way they had. There was no more loyal city than Cardiff. However, what he desired to convey to the Council was to extend to them the earnest desire of his Corporation that when the next Show was able to be held it would be at Cardiff. The money that was necessary and the arrangements would be forthcoming, and, in his humble judgment, if the Show was held in that city it would probably be the best the Society had held. In desiring to show how much the postponing of the Show was appreciated, all the people that had subscribed or promised to do so had stated that their offers will hold good, and Cardiff would do anything to make the Show an unequalled success, if the Council would only accept the invitation.

Mr. CORBETT said that as one who had the honour of being Chairman of the Cardiff Executive Committee, and, in a humble way, of representing the Marquis of Bute, he thought it would be well if he said a word or two. He assured the Council that if they would fall in with the Lord Mayor's request, and select Cardiff for the holding of their next Show, they would get a greater reception than they had received at Cardiff before. He sincerely hoped that the Show would be held on the same ground, which belongs to the Marquis of Bute, who had intimated that it would be available for the Society the following year. He did not think he had any more to say but to repeat what had already been said—that it was earnestly hoped that the Show would be held at Cardiff when the conditions of affairs would admit of this being done.

The PRESIDENT said he thought that the Cardiff Committee would wish the Council to say at once that they would accept the invitation to go to Cardiff, but he did not know whether he was in a position to say that that was exactly the case, though he could not conceive any combination of circumstances that would take them away from Cardiff the next time the Show was held. Personally he could not actually promise, but he would go so far as to say that he would do his utmost to support the application when the question of holding the next Show came forward.

Sir GILBERT GREENALL then moved that Cardiff be the venue of the Show the next time it is held, and the EARL OF COVENTRY seconded the motion, which was carried unanimously.

The LORD MAYOR OF CARDIFF thanked the Council on behalf of the citizens of Cardiff for the decision they had arrived at to hold the next Show in their city.

The following resolution, submitted by the Committee of Selection, was unanimously adopted :—

"That the exceptional conditions affecting agriculture and arising out of the war demand that the Royal Agricultural Society of England should in the national interest take action with a view to dealing with questions relating to agriculture, and more especially in regard to the food production of the country during the war; and that a War Emergency Committee of the Council be appointed to deal with these matters and advise the Council thereon."

They recommended that the Committee be constituted as follows :—The Duke of Richmond and Gordon, K.G., the Duke of Portland, K.G., the Earl of Northbrook, Sir Gilbert Greenall, Bart., C.V.O., Sir John Thorold, Bart., Messrs. C. Adeane, Richardson Carr, John Evens, R. W. Hobbs, John Howard Howard, J. L. Luddington, Alfred Mansell, Ernest Mathews, Christopher Middleton, Henry Overman, R. G. Patterson, John Rowell and C. W. Tindall.

Mr. ADEANE, in moving the resolution recommended by the Committee of Selection, said he did not think that any further justification was required for the motion which had been read than the gravity of the situation with regard

to the production of food in this country. Day after day ships were being sunk and tonnage reduced, with the inevitable result that prices were going up, and there was a real danger of shortage. Although we had not yet begun to tighten our belts, it was high time that we took stock of the position. There was a strong feeling, which he knew would be shared by the Council, that the Society should come out of its shell and exert all its influence and knowledge to help to solve, so far as it could, the difficult problems which now confronted us. We had not done so before because we were deterred by a too great reverence for the charter, which placed a ban on the Society's interference in questions of a political nature. Political questions had now resolved themselves into national questions, and we found ourselves in face of a great crisis. It seemed to him that the time had arrived for this National Society to act. He would briefly put before the Council some of the directions in which he thought the Committee could be of assistance. It could advise the Government Departments, if they so desired, by focussing the opinion of practical agriculturists all over the country. It could give confidence to agriculturists by providing a body which could help to solve many of their present difficulties and take up their just grievances. It could reassure the public, who would feel that at last a practical body was devoting its attention to the maintenance of the food production of the country. It could certainly stamp on, if it could not stamp out, calumny such as was contained recently in a provincial paper, which said that "The British farmers had no patriotism, and went to market to quaff the toast, 'May the war last long and still longer so that we may be able to fill our pockets.'" It would be able to sift some of the ridiculous proposals which were now being put before the country as to what should be done with the land. It would further be able to consider the effect of Government Orders and Regulations on production, which, if not properly thought out, were liable to defeat their own ends. In conclusion, he felt sure that this Committee would be welcomed by all agriculturists, and that it would have its time fully occupied.

The Duke of RICHMOND AND GORDON said he had very great pleasure in seconding Mr. Adeane's motion. He thought there were various points in connection with this matter which might be considered. But what he thought was the cardinal point was that they had selected representatives of the agricultural industry of whom the Society is composed, and that their Council was elected from the various districts or counties by those interested in that particular form of industry. They had to remember that there was a no more practical body than the Council of the Royal Agricultural Society. They had taken no active step in the past, for the reason of the terms of the charter which Mr. Adeane had referred to. He entirely agreed with what Mr. Adeane had said, that the country was in a condition that it had never been in before. He was not quite sure to what extent they would be able to put certain propositions before the powers that be, but such a Committee of the Royal Agricultural Society as was proposed was bound to make themselves heard and listened to.

In consequence of the postponement of the Show, the various Committees dealing with it would not be required to meet, unless called by the Chairman, and the Committee of Selection therefore recommended that the Committees and the Council meet on the day in each month which had been appointed for the Council to meet. The following times were suggested:—Chemical and Woburn, 10 a.m.; Botanical and Zoological, 10.30 a.m.; Veterinary, 10.30 a.m.; Selection, 11.0 a.m.; Journal and Education, 11.30 a.m.; Finance, 12 noon; Council, 2.30 p.m.

Proceedings at the Annual General Meeting of Governors and Members,

HELD AT THE ROYAL AGRICULTURAL HALL, ISLINGTON,

WEDNESDAY, DECEMBER 6, 1916.

THE DUKE OF RICHMOND & GORDON, K.G. (PRESIDENT), IN THE CHAIR.

Present:—Trustees.—Sir Gilbert Greenall, Bart., C.V.O., Lord Middleton, Lord Moreton, the Earl of Northbrook.

Vice-Presidents.—Mr. C. Adeane, Mr. Percy Crutchley, Mr. Ernest Mathews, the Duke of Portland, K.G.

Ordinary Members of the Council.—Mr. T. L. Aveling, Mr. Davis Brown, Mr. W. W. Chapman, the Hon. John E. Cross, Mr. John Evens, Mr. James Falconer, Sir Walter Gilbey, Bart., Lord Harlech, Mr. A. Hiscock, Mr. B. W. Hobbs, Mr. J. Howard Howard, Mr. W. F. Ingram, Mr. J. L. Luddington, Mr. Alfred Mansell, Mr. G. Norris Midwood, Mr. William Nocton, Mr. Henry Overman, Mr. F. Hamlyn Price, Mr. Frederick Reynard, Mr. Andrew Rogers, Mr. John Rowell, Mr. Fred Smith, Mr. C. W. Tindall, Mr. B. Trant, Colonel C. W. Wilson, the Right Hon. F. Wrench.

Governors.—Viscount Allendale, Mr. C. L. Evans, Capt. Beville Stanier, M.P.

Members.—The Hon. Alex. E. Parker, the Hon. C. B. Portman, Messrs. J. A. Adams, E. M. Archdale, J. A. Attwater, Captain Charles Bathurst, M.P., Messrs. Charles Bidwell, H. W. Bishop, J. H. Bridges, Arthur Britten, G. Kelsey Burge, William Burkitt, Major Castleman, Messrs. George Cave, J. F. Crewes, J. J. Oridlan, H. S. Daine, W. H. Daun, E. G. Dulcken, Walter Dunn, T. Edge, Francis Ellis, H. J. Elwes, T. Ewart, George Eyre, jun., William Gaymer, William Gibson, E. Griffin, J. Herbert Hall, S. Marriott Hall, W. Hedges, George Hobson, R. Holbeach, W. P. Laithwood, W. Langridge, F. Lay, James Lay, James Lindsay, C. J. B. Macdonald, C. E. Machen, W. S. MacWilliam, W. J. Malden, J. M. Martin, Henry Matthews, J. H. Mills, J. T. Mills, F. W. J. More, John M. Moubray, W. Nixon, P. J. Poels, E. C. Ransome, John P. Roberts, R. Tait Robertson, J. A. Robinson, Robert Sanders, C. C. Smith, Metcalfe S. Smith, J. Herbert Taylor, Howard Thomas, E. Trimen, Sydney Unite, R. Vaisey, R. S. Walters, M. H. Ward, James Watt, James Watt, jun., Jonas M. Webb, John Wesley, &c., &c.

The PRESIDENT said before they began their meeting he thought they should express their thanks to the Royal Agricultural Hall Company and the Smithfield Club for allowing them to meet in that very commodious building.

Before the adoption of the report was moved perhaps they would like him to make a retrospect of the past few months, and in doing so he would bring to their notice how successful had been the Society's Show at Manchester. (Hear, hear.) There had been a great deal against them; they were in the throes of a terrible war, and a considerable amount of uncertainty existed as to what they would be able to do, what facilities would be given to them, and what they would have to forego. In spite of all these inconveniences and drawbacks he thought they might thoroughly well congratulate themselves on the fact that they had a balance standing over from the Manchester Show of some thousands of pounds. (Hear, hear.) In that connection the thanks of the Society were due to the Hon. Director, Sir Gilbert Greenall, for his exertions. Unless they had somebody with the amount of energy and skill which he possessed and which he was not slow to put into operation, the success of the Show would be very differently spoken of than they were able to speak of it that day. (Hear, hear.)

As to what was to happen to the Show in the coming year, they would perhaps have seen an announcement in some of the papers that the Minister of Munitions had prohibited the holding of the Show. He thought that the way in which the announcement appeared was somewhat unfortunate, for he was afraid that it might convey to outside people, who were not aware of what had

actually taken place, an idea that the Society had been trying to "push" the Show, and that the Minister of Munitions had come down and given them a direct prohibition. The idea might be conveyed that they were not acting loyally to the country in this time of stress, and, therefore, he would like to explain briefly what had actually happened. On July 26 a deputation of the Council, consisting of the Duke of Portland, Sir Gilbert Greenall, and himself, went to see the Minister of Munitions to ascertain his view as to the likelihood or otherwise of the Show being held at Cardiff. After their interview with Dr. Addison he (the President) wrote informing Mr. McRow that it had been very satisfactory, and that Dr. Addison had said that before giving a final answer he should have to consult the Heads of Departments, but so far as he (Dr. Addison) was concerned there was no reason why the Show should not be held under the same conditions as this year.

Accordingly they went on with their preparations. On October 24 they had to apply to the Minister of Munitions for authority to go on with their building, and as they got the sanction of the authorities they presumed everything was right. Later they had a communication from the railway authorities at Cardiff, stating they were afraid that if the Show was proceeded with they would be unable to cope with the traffic which it would bring, and that it would be a fiasco. In consequence of that Sir Gilbert Greenall and Mr. Adeane went to Cardiff on Wednesday of last week and interviewed the local committee and the railway authorities. Having heard all there was to be said on the spot they came to the conclusion that it was inadvisable to hold the Show; and in the ordinary course of events the first announcement of their decision would have been made at that meeting.

What he wanted to impress upon them was that there was no question of their having run counter to the authorities in the slightest degree. Instead of there having been any necessity for the Ministry of Munitions to prohibit the Show, they had already decided that under the circumstances it was inadvisable to go on with it. He thought it was very unfortunate that such an announcement had been anticipated in the way it had been. He felt bound to make this statement because there was no more loyal body than the agriculturists of this country—(applause)—and nothing could be further from their minds than that any steps they might take would imperil in the slightest degree the success of the war.

The Council at their meeting that day had taken an important step in appointing a War Emergency Committee, whose function it would be to consider all questions relating to agriculture as affected by the war, and, where they thought it advisable and politic, to offer advice and suggestions to the authorities as to the best way of dealing with the present agricultural conditions. They had approached the question of the appointment of this Committee very carefully because there was a paragraph in their charter forbidding interference in political affairs. He looked upon this question, however, as one altogether outside what was known as party politics. They were all out for the nation to-day. (Applause.) What was desired was not only the success of our arms abroad, but, as far as possible, to maintain prosperity at home while mitigating the inconveniences and troubles which the war caused. The Society had never taken a very active part in making suggestions to the authorities on agricultural matters, but it was felt now that the time had arrived when they should assert themselves. (Hear, hear.) The Council of the Royal Agricultural Society was probably one of the most practical bodies in the country; there were none more capable—with their experience—of giving information as to the best means of cultivating the land, and it was right that the Members of the Society should have some say in matters connected with the restrictions which were to be imposed. At any rate he did not think the Society was a body which ought to be entirely ignored in the agricultural debates of the country. The Members of that Committee would not form a permanent part of the constitution of the Council, but it was hoped that in the

present time of stress the appointment of the Committee would commend itself to the country generally as an effort on the part of the leading agriculturists of this country to do what was best, not only for the country or the Members of the Society, but the whole agricultural interest of Great Britain. The members of the War Emergency Committee were as follows:—The Duke of Richmond and Gordon, K.G., the Duke of Portland, K.G., the Earl of Northbrook, Sir Gilbert Greenall, Bart., C.V.O., Sir John H. Thorold, Bart., Mr. Adeane, Mr. Richardson Carr, Mr. John Evens, Mr. Robert W. Hobbs, Mr. J. Howard Howard, Mr. J. L. Luddington, Mr. Alfred Mansell, Mr. Christopher Middleton, Mr. Ernest Mathews, Mr. Henry Overman, Mr. R. G. Patterson, Mr. John Howell, and Mr. C. W. Tindall. He hoped that the composition of the Committee would commend itself to the approbation of the Society.

There was one other matter which he wished to mention. The Cardiff authorities were naturally disappointed at not being able to give the Society that welcome which they had prepared for it. But when those happier times came to which they all looked forward so keenly and another opportunity was given them of holding their annual summer Show, the engagement with Cardiff would be kept, and the next Show of the Society would take place in that city. (Applause.)

Mr. H. J. ELWES, F.R.S. (Gloucestershire), in moving the adoption of the report, said he was glad to see that the Council had taken the important step of appointing a War Emergency Committee. Such a Committee, whose names they had just heard read, should carry a great deal of weight and authority—greater in fact than from any other body. He brought forward the question of labour as one to which the Committee should give early attention. The countryside had been absolutely stripped of the able-bodied men. Many men who were quite incapable of serving the country as soldiers were able to do a good deal in the way of growing food, and work on a farm, but they had been taken away at great expense to the country in the matter of allowances to their families, and they had never done one useful day's work as soldiers. Then in the matter of making use of the labour of prisoners there was still a great deal of uncertainty as to the conditions under which the prisoners would be allowed to work. He suggested that on this matter the Council of the Society could give the authorities a good deal of advice. Another subject which required attention was the killing of stock—owing to the high price of beef—which ought not to be killed. Then there was the question of preventing the over-feeding of valuable breeding stock. If something was done by the Society in this direction it would be welcomed by the working farmers of the country. He was not speaking of the "Professional Showman," who had to feed his stock to catch the eye of ignorant buyers. (Laughter.) Those gentlemen must be left to carry on their own work in their own way.

Mr. H. S. DAINE (Cheshire) seconded the adoption of the report. He remarked that they would all deplore the length of the obituary list in the report, in which occurred the names of men well known in agriculture throughout the country. He thought the Society was entitled to look for a much greater increase in its membership, and his own opinion was that it ought to be two or three times larger than it was. The duty devolved upon every Member to bring in another Member. He noticed in the report that the Society had raised about 100,000*l.* for the Agricultural Relief of Allies Fund, and that the sale at the Manchester Show had produced 3,000*l.* for the Fund. The 100,000*l.* would form a nucleus, and a very handsome one at that, but more money would be wanted if they were to do their duty by those who had suffered through the invasion of their country. He hoped that the 100,000*l.* would be followed by another 100,000*l.* and more than that if it was wanted. The profit on the Show had astounded him. Having regard to the conditions prevailing, the fact that they had a balance on the Show of nearly 5,000*l.* redounded greatly to the credit of everyone who helped to make the Show a success.

With reference to the War Emergency Committee he was sure that the Committee would be only too happy and always ready to receive any genuine practical suggestions from any Member of the Society. He thought that the practical side of the Manchester Show, as manifested in the Milking Competitions, had been of great good; indeed, he did not think that the excellent work which the Society was doing was properly appreciated. He mentioned the chemical assistance afforded by the Society as being of great value, and he advised farmers in procuring important necessities for cattle, to consult the Society's chemist, who would always prevent them from going wrong. With regard to labour, he admitted that the War Office must come first, but they were entitled to ask the War Office to leave the trained men—their stock men, herdsman, and shepherds. These men could instruct others, but if they were taken away it would be impossible to train other men to do their work.

Captain CHARLES BATHURST, M.P. (Gloucestershire) said that he regretted as much as they did the departmental officiousness of the Ministry of Munitions in taking action which had put a quite undeserved stigma upon that important and ancient agricultural Society. He welcomed most warmly the decision to appoint at once a War Emergency Committee, and for that Committee to offer its services to the Government, whatever Government they might have in future, in order to ensure that the agricultural policy of this country was carried on with a full realisation of the position in which we now stood, and the necessity for realising that in future this country had got to depend to a much greater extent than in the past upon its own agricultural resources. (Hear, hear.) We could not blink the fact that the submarine menace was one of the greatest possible gravity, and any courageous Government, one would imagine, would face the present position by not merely appealing to the agricultural community to come out to do its duty as it never did before, but to equip it properly with such facilities as would enable it to carry out its duty.

He regretted very much that the offer could not have been made at an earlier date by the Royal Agricultural Society in consequence of that somewhat unfortunate paragraph in its ancient charter. These were not the days for adhering strictly to any such formalities as articles in a charter might present. What he would ask that Committee to do was to represent to the Board of Agriculture that it was out to help the Government and not to supersede the Board. Unfortunately, departmental sensitiveness, departmental red tape, and departmental jealousies were such, even in the present crisis, that there was a real danger, unless they were prepared to make it perfectly clear to the Government that they were anxious and ready to help them with expert advice, but not in any way to supersede their officials, that they might still find insurmountable obstacles.

Reference had been made to the question of using prisoners of war on the land. For a long time the War Office declined to sanction the employment of prisoners in less numbers than 100, involving a large guard to supervise their work and prevent escape. That unfortunate regulation had prevented the utilisation of prisoners of war by those who wanted to increase the amount of food grown in this country. That obstacle was now removed, and for some days past they had been considering the conditions under which these men should be allowed to work on the farms. Red tape, however, was the difficulty and the conditions as yet had not been forthcoming, but he hoped that day to hear that the conditions had been settled and that the labour was available. In conclusion, he wished the Society more power to its elbow.

Mr. ROBERT SANDERS (Co. Cork) said there was a consensus of opinion in the country in favour of the appointment of a War Emergency Committee. What the agriculturists really wanted was a policy. They desired to know what the Government wanted, and he would suggest that the first thing the new committee should do should be to get a decisive answer from the

Government as to whether they did or did not want more food produced in the country next year. In his opinion such things as machinery, fertilisers, and all those articles which were absolutely necessary for the cultivation of the land should be carried in the same manner and with the same degree of urgency on the railways as munitions. Indeed, the manufacture of machinery and a supply of fertilisers should be looked upon as possessing the importance of the production of munitions.

Mr. EYRE (London) suggested the advisability of the Council appointing a surveyor from the town in which the Show was held to supervise the construction work.

The Report was then adopted.

Mr. BIDWELL (Cambridgeshire) then moved that Mr. Charles Adeane should be elected President of the Society, to hold office until the next annual general meeting. As a Cambridgeshire man he rejoiced that the name of their Lord Lieutenant had been put forward for the Presidency of the Society. Mr. Adeane was well known in the county, and esteemed and respected by everyone. He was a sound, practical agriculturist as they knew from the way in which the Babraham estate was managed, and also his herd of Shorthorns and his flock of Southdowns. Since 1905 Mr. Adeane had been Chairman of the Finance Committee, and he thought they might congratulate themselves on the fact that the financial position to-day was very different from what it was then. Personally, he had no doubt whatever that Mr. Adeane, as chairman of a strong committee, had done a great work in that respect. He was also Honorary Treasurer of the Agricultural Relief of Allies Fund, in connection with which he had also done very good work. Mr. Bidwell went on to say that if Mr. Adeane was elected President he would, he was sure, do great honour to the position, and would be second to none of those who had gone before him. (Hear, hear.) For Mr. Adeane's sake he regretted that the Cardiff Show was not going to be held this year. He could not help thinking, however, that the decision arrived at was a right one. In these strenuous times it was better that they should keep before them constantly the fact that they had got to beat the German nation. (Hear, hear.) He had the greatest possible pleasure in proposing the election of Mr. Adeane as their President for the coming year. (Applause.)

Mr. CREWES (Cornwall) seconded the proposition, remarking that he personally had become familiar with Mr. Adeane's name in connection with the movement for the Agricultural Relief of Allies, and was aware of the excellent work he was doing in that capacity also.

The resolution was carried unanimously.

Mr. ADEANE was greeted with applause on rising to acknowledge his election. He said he did not suppose that any agriculturist could have a greater ambition than to be President of the Royal Agricultural Society of England, and he was deeply grateful to them for having placed him in that proud position. The pleasure he felt was enhanced by the circumstance that his election had been proposed by his old friend and fellow Cambridgeshire man, Mr. Bidwell. (Hear, hear.) He wished to thank Mr. Crewes also for the kind way in which he had spoken of him. By electing him their President for the coming year they had put him under the great obligation to the Society to do all that he could during his term of office. He hoped that when that term came to an end he should be able to render a fair account of his stewardship so that they would feel to have been justified in their selection. He was quite sure that in that endeavour he should have the support not only of his colleagues on the Council, but of every Member of the Society. (Applause.)

He believed and hoped that the appointment of the War Emergency Committee that morning would meet with general approval among the agriculturists of the country. (Hear, hear.) The Committee had been formed not to promote any selfish agricultural interest, but to look after the interests of the nation,

and he hoped that they would be able really to focus the practical opinion of the agriculturists of the country. Whether the Government or the Government departments would ever think it worth while to come and ask their opinion on these questions was another matter, but he thought they might say that if they did think fit to come to the Committee the latter would give them the best advice they could. When it was remembered that the Council was composed of practical men it would be recognised that their advice would be worth taking. He ventured to think that the Government was making somewhat of a mistake in telling farmers how to do things. (Hear, hear.) The Government should say what they wanted done, and leave it to the farmers of the country to carry it out in their own way. The farmers could be depended upon to act patriotically at the present time. For his own part he did not think the public realised in the least the really fine performance that agriculturists were accomplishing at the present time. They were practically cultivating the same area of land as before the war with about 30 per cent. of their best men gone. They could not have done that unless they had had the help of the women of the country. (Hear, hear.) He was of the opinion that they might warn some of those people who were telling them what to do and who thought that everything was so easily done, that there was no question of increasing the area of land under the plough at the present time. To do that they must have more labour and more machinery. (Hear, hear.) At the moment he did not see where the labour was to come from, though possibly they might get machinery from abroad.

He hoped they would hear less of things that might be very excellent after the war was over, or things which might be carried out by prisoners, such as planting trees, draining bogs, or ploughing up pastures. If they had taken the advice given a year ago by the Board of Agriculture to plough up pastures, their state to-day would have been very much worse than it actually was. Keeping the land now under the plough in the highest state of cultivation possible was, he believed, the best way in which they could serve the nation. (Applause.)

The PRESIDENT announced that the following twelve Trustees had been nominated by the Council in accordance with the by-laws:—

H.R.H. Prince Christian, K.G., Cumberland Lodge, Windsor.
Bedford, Duke of, K.G., Woburn Abbey, Bedfordshire.
Bowen-Jones, Sir J. B., Bart., Council House Court, Shrewsbury.
Cornwallis, Col. F. S. W., Linton Park, Maidstone, Kent.
Coventry, Earl of, Croome Court, Severn Stoke, Worcestershire.
Devonshire, Duke of, K.G., Government House, Ottawa, Canada.
Greenall, Sir Gilbert, Bart., C.V.O., Walton Hall, Warrington.
Middleton, Lord, Birdsall House, Malton, Yorks.
Moreton, Lord, Sarsden House, Chipping Norton, Oxon.
Northbrook, Earl of, Stratton, Micheldever, Hampshire.
Parker, Hon. Cecil T., The Grove, Corsham, Wiltshire.
Thorold, Sir John H., Bart., Old Hall, Syston, Grantham.

On a show of hands they were declared re-elected as Trustees, to hold office until the next ensuing annual general meeting.

The Vice-Presidents were elected in a similar manner, their names being:—

Adeane, C. R. W., Babraham Hall, Cambridge.
Crutchley, Percy, Sunninghill Lodge, Ascot, Berkshire.
Derby, Earl of, K.G., Knowsley, Prescott, Lancashire.
Dugdale, J. Marshall, Llwyn, Llanfyllin, S.O. Mont.
Fellows, Rt. Hon. Sir Ailwyn, K.C.V.O., Honingham, Norwich.
Greaves, R. M., Wern, Fortmadoc, North Wales.
Mathews, Ernest, Little Shardsloe, Amersham, Bucks.
Northumberland, Duke of, K.G., Alnwick Castle, Northumberland.
Portland, Duke of, K.G., Welbeck Abbey, Worksop, Notts.
Powis, Earl of, Powis Castle, Welshpool, Mont.
Richmond and Gordon, Duke of, K.G., Goodwood, Chichester.
Yarborough, Earl of, Brocklesby Park, Lincolnshire.

The PRESIDENT then reported, under By-law 87, the names of the following ordinary Members of the Council who had been elected to represent the several divisions of the Society included in Group "B" in order that the meeting might take cognizance of their election:—

Durham: Christopher Middleton, Vane Terrace, Darlington.
 Yorks., West Riding: Major G. R. Lane-Fox, M.P., Bramham Park, Boston Spa, and Lt.-Col. E. W. Stanyforth, Kirk Hammerton Hall, York.
 Nottingham: Earl Manvers, Thoresby Park, Newark-on-Trent.
 Leicester: Sir A. G. Hazlerigg, Bart., Noseley Hall, Leicester.
 Rutland: Lord Ranksborough, O.V.O., C.B., Ranksborough, Oakham.
 Suffolk: Fred Smith, Deben Haugh, Woodbridge.
 Buckingham: Capt. J. Bell-White, R.N.R., Alderbourne Manor, Gerrard's Cross.
 Essex: Sir Walter Gilbey, Bart., Elsenham Hall, Elsenham.
 London: W. W. Chapman, 4, Mowbray House, Norfolk Street, Strand, W.C.; Sir Howard Frank, 20 Hanover Square, W.; and F. Hamlyn Price, 11 Ormonde Terrace, Regent's Park, N.W.
 Shropshire: Lord Harlech, Brogyntyn, Oswestry, and Alfred Mansell, College Hill Shrewsbury.
 Hereford: Arthur P. Turner, Fayre Oakes, Hereford.
 South Wales: O. Goltman Rogers, Stanage Park, Brampton Bryan.
 Devon: Andrew Rogers, Great Woodford, Plympton.
 Wiltshire: J. E. Rawlence, The Chantry, Wilton, Salisbury.
 Surrey: Capt Dunbar Kelly, Coombe Farm, Kingston-on-Thames.

Mr. W. BURKITT (Co. Durham) moved that the best thanks should be given to Messrs. Jonas M. Webb, Hubert J. Greenwood, and Newell P. Squarey for their services as Auditors, and that they be re-elected for the ensuing year.

Mr. KELSEY-BURGE (Kent) seconded the resolution, which was carried unanimously.

Mr. J. J. CRIDLAN (Gloucestershire), in proposing a vote of thanks to his Grace the Duke of Richmond and Gordon for his services as President during the past year, said it had been his privilege on the previous day to ask the members of the Smithfield Club to return a vote of thanks to their President, and it had given him great pleasure to do so, not only because their President was a leading man in agriculture, but because he was a breeder of Aberdeen-Angus cattle. (Laughter and applause.) On the present occasion he had the same felicity in proposing the thanks of that meeting to the Duke of Richmond and Gordon. After congratulating the President upon his victory on the previous day in the competition for South-down yearlings, Mr. Cridlan concluded by remarking that if there were two Societies above all others which brought agriculturists thoroughly together they were the Royal Agricultural Society and its mother—the Smithfield Club. (Laughter and applause.)

Mr. JAMES WATT (Cumberland), in seconding the proposition, recalled the services which the previous Duke of Richmond and Gordon had rendered to that Society. He was glad to see that his son had followed in his footsteps and emulated his example. Their President had shown his real interest in agriculture; on his own estate he stood well as owner, and as a public man in agriculture he stood out prominently.

The resolution was carried with acclamation.

The Duke of RICHMOND AND GORDON, in acknowledging the vote of thanks, said that in spite of all the adverse circumstances in operation the year had been one of great satisfaction to him as well as a year of considerable instruction. He had tried to learn farming all his life, but he was bound to say that the more he was brought into contact with those who possessed practical experience the greater was the amount of knowledge he was able to acquire of what, after all, was the biggest industry in the country. He thanked them most heartily for their very kind acknowledgment of his services in the past year.

The proceedings then terminated.

MANCHESTER SHOW,

JUNE 27 TO JULY 1, 1916.

Officials of the Show.

PRESIDENT :

THE DUKE OF RICHMOND AND GORDON, K.G.

Honorary Director.

Sir GILBERT GREENALL, Bart., C.V.O., Walton Hall, Warrington.

Stewards of Live Stock.

Horses.

CYRIL E. GREENALL, The Manor, Carlton Scroop, Grantham.

JOHN ROWELL, Bury, Huntingdon.

Cattle.

JOSEPH HARRIS, Brackenburgh Tower, Carlisle.

Sheep, Goats and Pigs.

L. C. WRIGLEY, 7, Park Street, Cirencester.

Steward of Dairy, Poultry and Produce.

ERNEST MATHEWS, Little Shardeloes, Amersham, Bucks.

Steward of Veterinary Examinations.

CYRIL E. GREENALL, The Manor, Carlton Scroop, Grantham.

Steward of Forage.

W. D. BULLOCK, Stamford Estate Office, Altrincham.

Stewards of Implements.

COLONEL F. S. W. CORNWALLIS, Linton Park, Maidstone.

The Hon J. E. CROSS, High Legh, Knutsford.

R. M. GREAVES, Wern, Portmadoc.

Stewards of Refreshments.

PERCY CRUTCHLEY, Sunninghill Lodge, Ascot.

WILLIAM HARRISON, Albion Ironworks, Leigh, Lancashire.

Steward of Flower Show.

A. A. PATON, Oneida, Sefton Park, Liverpool.

Stewards of Finance.

CHARLES R. W. ADEANE, Babraham Hall, Cambridge.

THOMAS L. AVELING, Boley Hill House, Rochester.

RICHARDSON CARR, Mill Lawn, Burley, Ringwood, Hants.

Surveyor.

J. R. NAYLOR, F.R.I.B.A., Cauldon Chambers, Long Row, Nottingham.

Secretary.

THOMAS MCROW, 16 Bedford Square, London, W.C.

JUDGES OF IMPLEMENTS.

Miscellaneous Implements entered for Silver Medals.

W. C. BROWN, Appleby, Doncaster.

J. BROUGHTON DUGDALE, Wroxall Abbey, Warwick.

JUDGES OF LIVE STOCK, &c.

HORSES.

Shires.—*Classes 1-11.*

F. W. GRIFFIN, Boro' Fen, Peterborough.

W. T. HAYR, Tur Langton Manor, Leicester.

Clydesdales.—*Classes 12-20.*

WALTER A. AITKENHEAD, Meadowbank, Polmont, N.B.

JOHN P. SLEIGH, St. John's Wells, Fyvie, N.B.

Suffolks.—*Classes 21-28.*

W. R. HUSTLER, Earls Hall, Cockfield, S.O., Suffolk.

EDWIN H. PRESTON, Wood Farm, Worlingworth, Framlingham, Suffolk.

Hunters.—*Classes 29-40; Polo Ponies.—Classes 41-45; and Riding Classes.—Classes 63-71.*

MAJOR J. UPTON, Ingmire Hall, Sedburgh, Yorkshire.

ROMER WILLIAMS, Newnham Hall, Daventry.

Cleveland Bays and Coach Horses.—*Classes 46 and 47.*

W. SCARTH DIXON, Fairlight, Luton, Beds.

Hackneys.—*Classes 48-54; Hackney Ponies.—Classes 55 and 56; and Harness Horses.—Classes 72-77.*

ARTHUR E. EVANS, Bronwylfa, Wrexham.

R. G. HEATON, Northaw House, Potters Bar, Herts.

Shetland Ponies.—*Classes 57 and 58.*

DR. CHARLES DOUGLAS, Auchloch, Lesmahagow, Lanarkshire.

Welsh Ponies.—*Classes 59-62.*

B. DAVIES, Tyctyd, Beulah, Garth, S.O., Breconshire.

Draught Horses in Gears.—*Classes 81-88.*

J. T. C. EADIE, Aldershaw, Lichfield.

L. C. WRIGLEY, 7 Park Street, Cirencester.

Turnouts.—*Classes 89 and 90.*

W. BAINBRIDGE, Walton House, Warrington.

Donkey Turnouts.—*Class 91.*

F. L. GOOCH, F.R.C.V.S., St. Martin's, Stamford.

CATTLE.

Shorthorns.—*Classes 92-104.*

JAMES DURNO, Rothiebrisan, Fyvie, Aberdeenshire.

CAPTAIN C. H. JOLLIFFE, Newbus Grange, Darlington.

C. W. TINDALL, Wainfleet, Lincolnshire.

Dairy Shorthorns.—*Classes 105-109; and Dairy Cattle.—Classes 110-113.*

D. W. COLLYER, Westbourne, Lancaster.

REGINALD HOLLINGTON, Lark Hill, Theydon Bois, Essex.

Lincolnshire Red Shorthorns.—*Classes 114-121.*

E. ABRAHAM, Otby House, Market Rasen.

T. H. B. FRESHNEY, Grainthorpe House, Grainthorpe, S.O., Lincs.

Herefords.—*Classes 122-129.*

G. H. GREEN, Wigmore Grange, Leintwardine, R.S.O.

R. W. HALL, The Field, Hereford.

Devons.—*Classes 130-135.*

ROBERT COOK, Crazelowman, Tiverton.

South Devons.—*Classes 136-139.*

JOHN HOARE, Mount Barton, Staver-ton, Totnes.

Longhorns.—*Classes 140-143.*

F. W. SOUTHAM, Foxhill Farm, West Haddon, Rugby.

Sussex.—*Classes 144-148.*

DANIEL SWAFFER, Mumford, Kingsnorth, Ashford, Kent.

Welsh.—*Classes 149-156.*

RICHARD W. PRITCHARD, Coedmarion, Carnarvon.

Red Polls.—Classes 157-162.

HERBERT BLOFIELD, Wilby, Attleborough, Norfolk.

A. D. BRUCE, Estate Office, Elvetham Hall, Winchfield, Hants.

Aberdeen-Angus.—Classes 163-168.

LEWIS BEATON, Terry Cottage, Blantyre Street, Cullen, N.B.

ARCHIBALD WHYTE, Inverquharity, Kirriemuir, N.B.

Galloways.—Classes 169-173.

JAMES WILSON, Tundergarth Mains, Lockerbie, N.B.

Ayrshires.—Classes 174 and 175.

HUGH W. B. CRAWFORD, Chapmananton, Castle Douglas, N.B.

Holstein-Friesians.—Classes 176-181.

R. G. ANEMA, Strumphletstr, 21, Hengelo, Holland.

H. T. WILLETT, Monkton Parsonage Farm, Ramsgate.

Jerseys.—Classes 182-189.

W. ASHCROFT, 13 The Waldrons, Croydon, Surrey.

J. H. SHORE, Whatley Combe, Frome, Somerset.

Guernseys.—Classes 190-196.

J. D. TOOGOOD PARSONS, 9 Manor Road, Rushall, Tunbridge Wells.

Kerries.—Classes 197-199; and**Dexters.—Classes 200-203.**

G. TITUS BARHAM, Sudbury Park, Wembley, Middlesex.

Milk Yield Prizes and Butter Tests.

Awards made on Certificate of the STEWARD OF DAIRYING.

SHEEP.**Oxford Downs.—Classes 217-221.**

J. M. EADY, Lancefield, Thorpe Malsor, Kettering.

J. H. TOPPIN, Musgrave Hall, Skelton, Penrith.

Shropshires.—Classes 222-227.

S. F. M. NEVETT, Yorton, Shrewsbury.

THOMAS FRANK, Cound Arbour, Shrewsbury.

Southdowns.—Classes 228-233.

WILLIAM BROWN, Challoners, Rottingdean, Sussex.

JOHN LANGMEAD, Bailiffs Court, Climping, Littlehampton.

Hampshire Downs.—Classes 234-239.

MORTIMER G. GOLDSMITH, Blendworth, Horndean, Hants.

CHARLES STANFORD, Estate Office, Breamore, Hants.

Suffolks.—Classes 240-245.

J. R. GRIMSEY, St. Helena, Dunwich, Suffolk.

Dorset Downs.—Classes 246-248.

HAROLD P. M. WARDLAW, Holway Farm, Sherborne, Dorset.

Dorset Horns.—Classes 249-252.

JOHN H. CHICK, Wynford Eagle, Dorchester.

Eylands.—Classes 253-257.

FRED. J. WILLIAMS, Lucton Court, Kingsland, S.O., Herefordshire.

Kerry Hill (Wales).—**Classes 258-260.**

JOHN ANWYL, Preston Hall Farm, Preston Brockhurst, Shrewsbury.

Lincolns.—Classes 261-266.

CHARLES CLARKE, Holmleigh, Dorrington, Lincoln.

T. A. JACKSON, Golden Hill, Wansford, Driffield.

Leicesters.—Classes 267-270.

H. H. STAVELEY, Tibthorpe, Driffield.

Border Leicesters.—Classes 271-273.

JAMES CAMPBELL, Illicston, Mid-Calder, N.B.

Wensleydales.—Classes 274-279.

WILLIAM DINSDALE, Low Bolton, Redmire, S.O., Yorkshire.

J. O. TROTTER, Scruton, Bedale, Yorkshire.

Lonks.—Classes 280 and 282; and**Derbyshire Gritstones.—Classes 283 and 284.**

WILLIAM S. AIREY, Whalley, Blackburn.

Kent or Romney Marsh.—**Classes 285-290.**

C. J. G. HULKES, Somerhill Estate Office, Tonbridge, Kent.

HENRY RIGDEN, Etchinghill, Shorncliffe Camp.

Cotswolds.—Classes 291-294.

JOHN W. BRAIN, Manor Farm, Upper Slaughter, Glos.

Devon Long Wools.—
Classes 295 and 296.

ROBERT COOK, Crazelowman,
Tiverton.

South Devons.—Classes 297-301.

JOHN HOARE, Mount Barton, Staver-
ton, Totnes.

Dartmoors.—Classes 302-304.

THOMAS PALMER, Newington,
Tavistock, Devon.

Exmoor Horn.—Classes 305-307.

WILLIAM GAMMIN, The Barton,
Simonsbath, South Molton, North
Devon.

Cheviots.—Classes 308-310.

JAMES K. SMITH, Leaston, Humber

Herdwicks.—Classes 311-313.

JOHN NEWBY, Aulthurstside,
Broughton-in-Furness.

Welsh Mountain.—Classes 314-317.

ROBERT ROBERTS, Rhydygarnedd,
Towyn.

**Black-faced Mountain.—Classes 318
and 319.**

HUGH CAREUTHERS, White Hill,
Gillsland, Carlisle.

GOATS.

Goats.—Classes 320-329.

B. RAVENSCROFT, 38, Lancaster
Park, Richmond, Surrey.

PIGS.

Large White Boars.—Classes 331-334.

R. STUART, Brook Vale, Sowerby,
Garstang.

Large White Sows.—Classes 335-338.

HERBERT H. OWTRAM, Newland
Hall, Lancaster.

Middle Whites.—Classes 339-344.

W. R. HILL, 342, Prestwood Road,
Wolverhampton.

Tamworths.—Classes 345-350.

CHARLES L. COXON, Webton Court,
Madley, Hereford.

Berkshires.—Classes 351-356.

WILLIAM A. BARNES, Hasluck's
Green Farm, Shirley, Birmingham.

Large Blacks.—Classes 357-362.

JOHN M. MOUBRAY, Sutton Farm,
Lewes, Sussex.

Lincolnshire Curly-coated.—
Classes 363-368.

THOMAS P. HORN, Elm Grange, East
Eckington, Boston.

POULTRY.

Classes 369-520.

D. HARCOURT CLARKE, Stancliffe
Hall, Matlock.

REV. E. COLLEY, Haveray Park, Kirk
Hammerton, York

WILLIAM FOOTE, Springfield Poultry
Farm, Armthorpe, Doncaster.

W. J. GOLDING, Westwood Farm,
Weald, Kent.

WILL HOOLEY, The Firs, Hartley,
Longfield, Kent.

H. INMAN, 12 Squire Lane, Girling-
ton, Bradford.

W. H. SILVESTER, Hawthorns, Hills-
borough Park, Sheffield.

MRS. WITHAM SUTCLIFFE, 98 Mont-
rose Street, Burnley.

JOHN WHARTON, Honeycott, Hawes,
Yorkshire.

PRODUCE.

Butter.—Classes 521-526 ;

Soft Cheeses.—Classes 540 and 541.

ALEC. TODD, British Dairy Institute,
Reading.

Cheese.—Classes 527-539.

JOHN BENSON, The Kettering Dairy,
Dalkeith Place, Kettering.

JOHN EMBERTON, Crewe.

ERNEST TRELFALL, Queen Square,
Lancaster.

Bacon and Hams.—Classes 542-555.

A. F. HELPS, Cummersdale, Carlisle.

Cider and Perry.—Classes 556-563.

B. T. P. BARKER, M.A., Long Ashton,
Bristol.

WILLIAM GAYMER, Attleborough,
Norfolk.

Bottled Fruits and Vegetables.—

Classes 564-578.

W. G. TURNER, 18 and 19 Pall Mall,
London, S.W.

Wool.—Classes 574-592.

FREDK. C. COLLINS, Vincent Street,
Sunbridge Road, Bradford.

JOHN L. MARGERISON, Canal Road,
Bradford.

Hives and Honey.—Classes 1-28

DR. W. ANDEBTON, Minorin House,
Ormskirk

N. J. BOLD, Almonds Green, West
Derby, Liverpool.

FLOWER SHOW.

N. F. BARNES, Eaton Gardens, Chester.

THOMAS JONES, Bryn, Penylan,
Ruabon.

F. JORDAN, The Gardens, Warter
Priory, York.

JAMES VERT, Chirk Castle Gardens,
Whitehurst, Ruabon, N. Wales.

CHIEF VETERINARY OFFICER.

JOHN MALCOLM, F.R.C.V.S., Holiday
Street Wharf, Birmingham.

ASSISTANT VETERINARY OFFICER.

WILLIAM TRIGGER, F.R.C.V.S.,
Newcastle, Staffs.

VETERINARY INSPECTORS.

Professor J. MACQUEEN, F.R.C.V.S.,
Royal Veterinary College, Camden
Town, London, N.W.

HUGH H. FERGUSON, M.R.C.V.S.,
Suez Street, Warrington.

F. L. GOOCH, F.R.C.V.S., St. Martin's,
Stamford.

J. B. ROBERTSON, M.R.C.V.S.,
Lancaster.



AWARDS OF PRIZES AT MANCHESTER, 1916.

ABBREVIATIONS.

- I., First Prize. II., Second Prize. III., Third Prize. IV., Fourth Prize.
V., Fifth Prize. R. N., Reserve Number. H. C., Highly Commended.
C., Commended.

N.B.—The responsibility for the accuracy of the description or pedigree, and for the eligibility to compete of the animals entered in the following classes, rests solely with the Exhibitors.

Unless otherwise stated, each Prize Animal in the Classes for Horses, Cattle, Sheep, and Pigs, was "bred by Exhibitor."

HORSES.

Shires.

No. in
Cata-
logue

Class 1.—*Shire Stallions, foaled in 1915.*

[11 entries.]

- 4 I. (£15 1)—SIR WALPOLE GREENWELL, BT., Marden Park, Woldingham, Surrey, for Marden Dagnam, bay; s. Champion's Goalkeeper 30298, d. Marden Dorina 75212 by Marden Forest King 28534.
- 2 II. (£10.1)—JAMES FORSHAW & SONS, Carlton-on-Trent, Newark, Notts., for Newark Coming King, bay, bred by Arthur Dickins, Appleton Gate, Newark; s. Tandridge Coming King 29928, d. Claypole Queen 73958 by Barn King 24925.
- 5 III. (£5.1)—SIR WALPOLE GREENWELL, BT., for Marden Whitfield, brown; s. Champion's Goalkeeper 30298, d. Pailton Forest Lass 61435 by Ratcliffe Forest King 23632.
- 8 IV. (£3.)—LORD MIDDLETON, Birdsall House, Malton, Yorks., for Nawton Forester, brown, bred by John Davison, Lund Court, Nawton, Yorks.; s. Tandridge Forester 29928, d. Nawton Silver Queen 67992 by Dunsmore Jameson 2nd 20158.
- 3 R. N.—A. GRANDAGE, LTD., Bramhope Stud, Monks Heath, Chelford, Cheshire, for Bramhope Eustie.
H. C.—1.

Class 2.—*Shire Stallions, foaled in 1914.* [7 entries.]

- 14 I. (£15, & R. N. for Champion.1)—SIR WALPOLE GREENWELL, BT., Marden Park, Woldingham, Surrey, for Capernwray 33083, brown, bred by Harling Richardson, Capernwray Farm, Carnforth; s. Warton Dray King 30002, d. Capernwray Queen 47413 by Patrick 2nd 19929.
- 13 II. (£10.)—JAMES FORSHAW & SONS, Carlton-on-Trent, Newark, Notts., for Brook Vale Foreman 33061, bay, bred by John Harrison, Roseacre Hall, Kirkham, Lancs.; s. Albion Foremost 33031, d. Roseacre Belle 72248 by Horbling Harold 15647.
- 18 III. (£5.)—JOHN ROWELL, Bury, Huntingdon, for Bury Kingmaker 33074, bay, bred by A. G. Montford, Ivy House, Churchstoke, Mont.; s. Tandridge Kingmaker 29930, d. May Thorn 57732 by Hendre Baronet 18714.
- 16 R. N.—JOHN O. JACKSON, The Grange, Askern, Doncaster, for Aldwick Champion.
H. C.—17.

Class 3.—*Shire Stallions, foaled in 1913.* [8 entries.]

- 26 I. (£15, & Champion.2)—THE DUKE OF WESTMINSTER, Eaton, Chester, for Eaton Fenland King 32333, brown, bred by G. L. Morris, Thorney, Peterborough; s. Eaton Nunsuch 27301, d. Fenland Dinah 58927 by Hendre Conqueror 17385.

¹ Prizes given by the Shire Horse Society.

² Champion Gold Medal given by the Shire Horse Society for the best Stallion in Classes 1-3.

liv *Award of Live Stock Prizes at Manchester, 1916.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 21 II. (£10.)—DENBY COLLINS, The Shire Stud, Bramhope, Leeds, for Primley Freeman 22785, bay, bred by D. R. Lloyd, Dinam Valley, Anglesen; s. Tatton Dray King 23777, d. Lolworth Queen 51575 by Hendre Duke 18178.
- 25 III. (£5.)—F. E. MUNTZ, Umberslade, Hockley Heath, Warwickshire, for Colney Albert 32251, bay, bred by Charles Morris, Highfield Hall, St. Albans; s. Norbury Menestrel 23543, d. Bardon Alberta 46941 by Lockinge Forest King 18867.
- 24 R. N.—JAMES MERRITT, 40 Adelphi Street, Birkenhead, for Alderman 3rd.

Class 4.—*Shire Fillies, foaled in 1915.* [13 entries.]

- 33 I. (£15.)—J. G. WILLIAMS, Pendley Manor, Tring, Herts., for Pendley Duchess, bay; s. Norbury Menestrel 23543, d. Halstead Duchess 7th 67223 by Redlynch Forest King 23626.
- 32 II. (£10.)—SIR WALPOLE GREENWELL, BT., Marden Park, Woldingham, Surrey, for Sister Agnes, brown, bred by H. S. Thomas, Addington Lodge, Croydon; s. Champion's Goalkeeper 30298, d. Lady Betty 75009 by Hendre Champion 18079.
- 34 III. (£5.)—ERNEST W. HEADINGTON, Cippenham Court, Slough, Bucks., for Orfold Active Girl 2nd, brown, bred by Alfred Luckin, Orfold, Billingshurst, Sussex; s. Norbury Menestrel 23543, d. Orfold Movement 71869 by Montford Jupiter 18940.
- 37 IV. (£3.)—W. & H. WHITLEY, Primley Farm, Paignton, for Primley Haides, bay, bred by John R. Turton, Baby, Thornton Hough, Chester; s. Primley Draughtsman 30801, d. Flower 74492 by Hendre Spark 18795.
- 39 R. N.—E. J. WYTHES, Copped Hall, Epping, Essex, for Copped Hall Lassie.
H. C.—29.

Class 5.—*Shire Fillies, foaled in 1914.* [7 entries.]

- 45 I. (£15. & R. N. for Champion.)—J. G. WILLIAMS, Pendley Manor, Tring, for Pendley Royal Princess 82614, bay; s. Norbury Menestrel 23543, d. Bardon Forest Princess 55968 by Lockinge Forest King 18867.
- 40 II. (£10.)—J. H. APPELBY, Home Farm, Groby, Leicester, for Bradgate Pearl 80633, bay; s. Bradgate Majestic 20139, d. Lockinge Garnet 42553 by Buscot Senator 17846.
- 46 III. (£5.)—E. J. WYTHES, Copped Hall, Epping, for Copped Hall Rosabelle, bay; s. Norbury Menestrel 23543, d. Copped Hall Rosebud 56570 by Dunsmore Jameson 17972.
- 43 R. N.—THE DUKE OF WESTMINSTER, Eaton, Chester, for Oldport Debutante.
H. C.—42. C.—41.

Class 6.—*Shire Fillies, foaled in 1913.* [1 entry.]

[Not forward.]

Class 7.—*Shire Mares, foaled in or after 1912, with Foals at foot.*

[4 entries.]

- 49 I. (£15.)—WILLIAM EDWARD DODD, Ford Hall, Tanworth-in-Arden, Warwickshire, for Ford Hall Patch 74507, brown, foaled in 1912; s. Danesfield Stonewall 23214, d. Ford Hall Starlight 67058 by Holker Prince 26310. [Foal by King's Warrior 31663.]
- 48 II. (£10.)—PETER DAVIES, Midlands Farm, Warburton, Cheshire, for Ravenscroft May Queen 75733, bay, foaled in 1912, bred by John A. Kay, Ravenscroft Hall, Middlewich, Cheshire; s. Lymm Collin 26419, d. Whapload Countess 30436 by Horbling Hereward 14102. [Foal by Pendley Forest Prince 29715.]

Class 8.—*Shire Mares, foaled in or before 1911, with Foals at foot.*

[18 entries.]

- 53 I. (£15. & Champion.)—JOHN BRADLEY, Halstead House, Tilton, Leicester, for Halstead Royal Duchess 63853, bay, foaled in 1909; s. Lockinge Forest King 18867, d. Halstead Duchess 3rd 42121 by Menestrel 14180. [Foal by Eaton Nunuch 27301.]
- 52 II. (£10.)—CAPT. SIE BRIBBLEY SHEFFIELD, BT., Stud Farm, Tickhill, Yorks., for Miss Lofly 71895, bay, foaled in 1911, bred by the late Lord Rothschild, Tring Park, Herts.; s. Babingley Nulli Secundus 26993, d. Lady Ruby 64142 by Childwick Champion 23215. [Foal by Shipton King 26692.]
- 51 III. (£5.)—EDGAR I. APPELBY, Thurlaston Grange, Rugby, for Rea Lassie 68353, dark bay, foaled in 1910, bred by Thomas Woollicroft, The Harracles, Leek, Staffs.; s. Redlynch Forest King 23626, d. Dorothy 44784 by Parkside 13436. [Foal by Weldon 28917.]
- 67 IV. (£3.)—J. G. WILLIAMS, Pendley Manor, Tring, for Bardon Forest Princess 55968, bay, foaled in 1907, bred by W. Grewcock, Desford, Leicester; s. Lockinge Forest King 18867, d. Princess 49083 by Pauld Charming 14629. [Foal by Norbury Menestrel 23543.]
- 65 R. N.—W. & H. WHITLEY, Primley Farm, Paignton, for Rickford Gem.
H. C.—52, 59. C.—54, 58.

¹ Prizes given by the Shire Horse Society.

² Champion Gold Medal given by the Shire Horse Society for the best Mare or Filly in Classes 4-8.

Award of Live Stock Prizes at Manchester, 1916. 1v

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 9.—*Shire Colt Foals, the produce of Mares entered in Classes 7 or 8.*

[10 entries.]

- 75 I. (£10).—RICHARD C. PRYCE, Broughton, Shrewsbury, for bay, foaled April 6; s. Duke's Double 30385, d. Whym Rose 83494 by The Forest Chief 17021.
 72 II. (£5).—THOMAS JONES, Quarry Farm, Godstove, Surrey, for bay, foaled March 17; s. Champion's Goalkeeper 30296, d. Chatley Rose 63196 by Amberley Baronet 24892.
 77 III. (£3).—J. G. WILLIAMS, Pendley Manor, Tring, for bay, foaled Feb. 20; s. Eaton Nunsuch 27301, d. Alpha Friar Queen 65640 by Friar John 24266.
 76 R. N.—CAPT. SIR BERKELEY SHEFFIELD, BT., Stud Farm, Tickhill, Yorks.
 H. C.—71. C.—70.

Class 10.—*Shire Filly Foals, the produce of Mares entered in Classes 7 or 8.*

[9 entries.]

- 80 I. (£10).—J. H. APPLEBY, Home Farm, Groby, Leicester, for bay, foaled Feb. 2; s. Bradgate Victor King 32150, d. Clumber Sheba 59862 by Royal Derby 16993.
 87 II. (£5).—J. G. WILLIAMS, Pendley Manor, Tring, for Pendley Royal Princess 2nd, bay, foaled Feb. 19; s. Norbury Menestrel 23543, d. Bardon Forest Princess 55068 by Lockinge Forest King 18867.
 85 III. (£3).—THE DUKE OF WESTMINSTER, Eaton, Chester, for bay, foaled March 24; s. Eaton Nunsuch 27301, d. Naseby Rambler 71776 by Birdsall Menestrel 19337.
 82 R. N.—JOSEPH CARSON, Torrells Hall, Ongar, for Torrells Golden Lassie.
 H. C.—86. C.—79, 84.

Class 11.—*Shire Geldings, foaled in or before 1913.¹* [6 entries.]

- 88 I. (£15).—EDWARD DAVIES, The Walk, Partington, near Manchester, for Caracatus, black, foaled in 1910, bred by the late Thomas Dare, Poling, Arundel; s. Poling Hector 26560, d. Intake Ohnm 59258 by Harold 3703.
 93 II. (£10).—P. WALKER & SON (Warrington & Burton) LIMITED, Warrington, for Delight, grey, foaled in 1911, bred by J. H. Finnikin, Onecote, Leek, Staffs; s. Redlynch Forest King 23626, d. Pethills Flower 61484 by King of the Peak 17430.
 90 III. (£5).—PETER DAVIES, Midlands Farm, Warburton, Cheshire, for Midlands Masterman, brown, foaled in 1911, bred by William Measures, Hargrave, Huntingdon; s. Gaer Conqueror 25218, d. Hillstone Sunflower 54146 by Ercall Wynn 14630.
 91 R. N.—LIVERPOOL CORPORATION, Veterinary Department, 30, Hutton Garden, Liverpool, for John Bull.
 H. C.—92. C.—89.

Clydesdales.¹

Class 12.—*Clydesdale Stallions, foaled in 1915.* [8 entries.]

- 95 I. (£15).—WILLIAM DUNLOP, Dunure Mains, Ayr, for Dunure Ernest, bay, bred by J. Ernest Kerr, Harviestoun, Dollar; s. Dunure Footprint 15203, d. Harviestoun Phyllis 37631 by Royal Favourite 10030.
 98 II. (£10).—JAMES GRAY, Birkenwood, Gargunnoch, for Botha, brown; s. Baron of Buchlyvie 11263, d. Darrell 21360 by Sylvander 10933.
 99 III. (£5).—JAMES KILPATRICK, Craigie Mains, Kilmarnock, for brown, bred by James Anderson, Pitcarry, Bervie; s. Baron of Buchlyvie 11263, d. Favourite Queen 32062 by Royal Favourite 10030.
 100 R. N.—W. M. RITCHIE, Balcairn, Old Meldrum, for Balcairn's Ambition.

Class 13.—*Clydesdale Stallions, foaled in 1914.* [6 entries.]

- 103 I. (£15, & Champion.²)—WILLIAM DUNLOP, Dunure Mains, Ayr, for Dunure Independence 18706, bay, bred by James McGaw, Mount Pleasant, Stranraer; s. Baron of Buchlyvie 11263, d. Rita 21506 by Marcellus 11110.
 106 II. (£10, & R. N. for Champion.²)—JAMES KILPATRICK, Craigie Mains, Kilmarnock, for Craigie Excelsior 18864, bay, bred by George McDowell, Glenhowl, Glenluce; s. Bonnie Buchlyvie 14032, d. Mayflower of Glenhowl 37749 by Ryecroft 13722.
 104 III. (£5).—WILLIAM DUNLOP, for Dunure Walker 18724, brown, bred by Hugh Walker, Threethorns, Kirkmichael; s. Baron of Buchlyvie 11263, d. Fiona 27880 by Montrave Mereman 11437.
 105 R. N.—JAMES GRAY, Birkenwood, Gargunnoch, for Concord.

Class 14.—*Clydesdale Stallions, foaled in 1913.* [3 entries.]

- 100 I. (£15).—WILLIAM DUNLOP, Dunure Mains, Ayr, for Dunure Footline 18333, black bred by George Argo, Petty, Fyvie; s. Dunure Footprint 15203, d. Love of Petty 54763 by Everlasting 11351.

¹ £30 towards these Prizes were given by the Clydesdale Horse Society.

² Champion Prize of £10 given by the Clydesdale Horse Society for the best Stallion in Classes 12-14.

lvi *Award of Live Stock Prizes at Manchester, 1916.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 110 II. (£10).—WILLIAM DUNLOP, for Dunure Vortex 18342, bay, bred by John Davidson, Mains of Glascoford, Kinellar; s. Dunure Footprint 15203, d. Daisy of Glascoford 19362 by Prince Utica 11474.
- 108 III. (£5).—HENRY DOBSON & SON, Helington Laithes, Kendal, for Marchmont 18442, bay, bred by John Merson, Millhill, Gartley; s. Everlasting 11331, d. Dunure Molly 35982 by Baron of Buchlyvie 11263.

Class 15.—*Clydesdale Fillies, foaled in 1915.* [6 entries.]

- 112 I. (£15).—WILLIAM DUNLOP, Dunure Mains, Ayr, for Dunure Lady Friend, black, bred by James Fleming, Easter Cone, Auchterarder; s. Dunure Footprint 15203, d. Gem of Craigwillie 21597 by Prince Thomas 10262.
- 111 II. (£10).—WILLIAM DUNLOP, for Dunure Gladsmile, bay, bred by William Renwick, Meadowfield, Corstorphine; s. Auchensflower 12007, d. Dunure Gladeye by Dunure Footprint 15203.
- 114 III. (£5).—JAMES FLEMING, Easter Coull, Auchterarder, for Golden Maid, bay, bred by Harry Milne, Fetterletter, Fyvie; s. Dunure Footprint 15203 d. Ella by Perfect Motion.

Class 16.—*Clydesdale Fillies, foaled in 1914.* [6 entries.]

- 121 I. (£15, & R.N. for Champion.¹)—W. M. RITCHIE, Balcairn, Old Meldrum, Aberdeenshire, for Balcairn's Lady Alice, black, bred by J. & P. Donald, Lethen, Fyvie; s. Dunure Footprint 15203, d. Christie Sleigh 35206 by Everlasting 11331.
- 122 II. (£10).—H. E. ROBERTS, Monk Castle, Southwaite, Carlisle, for Fact, bay, bred by W. M. Ritchie, Balcairn, Old Meldrum; s. Dunure Footprint 15203, d. Balcairn's Fairy 38103 by Star of Cowal 13218.
- 117 III. (£5).—WILLIAM DUNLOP, Dunure Mains, Ayr, for Balcairn's Primrose, bay, bred by William M. Ritchie, Balcairn, Old Meldrum; s. Dunure Footprint 15203, d. Waterton Baroness 93571 by Omsabianca 10523.
- 119 E. N.—JAMES GRAY, Birkenwood, Gargunnoch, for Nellie Paterson.

Class 17.—*Clydesdale Fillies, foaled in 1913.* [4 entries.]

- 125 I. (£15, & Champion.¹)—GEORGE A. FERGUSON, Surradale, Elgin, for Rosalind, black, bred by William McKenzie, Newton, Elgin; s. Dunure Footprint 15203, d. Rose of Allandale 29990 by Allandale 12418.
- 126 II. (£10).—JAMES KILPATRICK, Craigie Mains, Kilmarnock, for Craigie Sylvia, bay, bred by the late Robert Chapman, Johnstone, Glenboig; s. Apukwa 14567, d. Heather Charm 26193 by Baron's Pride 9122.
- 124 III. (£5).—WILLIAM DUNLOP, Dunure Mains, Ayr, for Dunure Hagar, black, bred by John P. Sleigh, St. Johns Wells, Fyvie; s. Dunure Footprint 15203, d. Elaine 36406 by Baron's Pride 9122.
- 123 E. N.—WILLIAM DUNLOP, for Dunure Ardour.

Class 18.—*Clydesdale Mares, with Foals at foot.* [8 entries.]

- 129 I. (£15).—JAMES GRAY, Birkenwood, Gargunnoch, for Molly, bay, foaled in 1913, bred by Andrew Gray, Kersie Mains; s. Bonnie Buchlyvie 14032, d. Susie of Kersie 23764 by Hiawatha 10067. [Foal by Dunure Birkenwood 18327.]
- 128 II. (£10).—WILLIAM DUNLOP, Dunure Mains, Ayr, for Dunure Essence, bay, foaled in 1912, bred by Richard Dunn, Udston, Hamilton; s. Montrave Mac 9953, d. Katarina 19427 by Baron's Pride 9122. [Foal by Dunure Footprint 15203.]

Class 19.—*Clydesdale Foals, the produce of Mares entered in Class 18.* [3 entries.]

- 131 I. (£10).—WILLIAM DUNLOP, Dunure Mains, Ayr, for brown colt, foaled May 3; s. Dunure Footprint 15203, d. Dunure Essence by Montrave Mac 9953.
- 132 II. (£5).—JAMES GRAY, Birkenwood, Gargunnoch, for bay colt, foaled May 26; s. Dunure Birkenwood 18327, d. Molly by Bonnie Buchlyvie 14032.

Class 20.—*Clydesdale Geldings, foaled in or before 1913.* [4 entries.]

- 136 I. (£15).—SCOTTISH CO-OPERATIVE WHOLESALE SOCIETY, LTD., 95 Morrison Street, Glasgow, for Tom, black, foaled in 1912, bred by Burgess, Kananashill, New Machar, Aberdeenshire; s. Baron Rothchild 12939.
- 135 II. (£10).—SCOTTISH CO-OPERATIVE WHOLESALE SOCIETY, LTD., for Jim, brown, foaled in 1912, bred by James McMillan, Brocklock, Marybole; s. Dunedin 12951.
- 134 III. (£5).—WILLIAM KERR, Old Grainney, Greta, Carlisle, for Harry, bay, foaled in 1910, bred by Robert Fisher, Low Walton, Cockermouth; s. Sir Everest 10917.
- 133 E. N.—WILLIAM D. DRYDEN, Dene House and Seaham Hall Farms, Seaham Harbour, for Gay Lad.

¹ Champion Prize of £10 given by the Clydesdale Horse Society for the best Mare or Filly in Classes 15-18.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Suffolks.¹

Class 21.—*Suffolk Stallions, foaled in 1915.* [3 entries.]

- 137 I. (£15).—KENNETH M. CLARK, Sudbourne Hall, Orford, Suffolk, for Sudbourne Petrograd 4445; s. Sudbourne Peter 3955, d. Sudbourne Redwing 6388 by Sudbourne Edward 3304.
 139 II. (£10).—SIR CUTHBERT QUILTER, BART., M.P., Methersgate Hall, Woodbridge, for Bawdsey Charger 4517; s. Bawdsey Marshal Ney 3385, d. Bawdsey Bloom 7084 by Bawdsey Harvester 3076.
 138 III. (£5).—ARTHUR T. PRATT, Morston Hall, Trimley, Ipswich, for Morston Stannard 4532, bred by H. Stanford, Halesworth; s. Darsham Sheik 4139, d. Halesworth Depper 7600 by Bouige Monarch 3054.

Class 22.—*Suffolk Stallions, foaled in 1914.* [8 entries.]

- 141 I. (£15).—KENNETH M. CLARK, Sudbourne Hall, Orford, Suffolk, for Sudbourne Pioneer 4374; s. Sudbourne Peter 3955, d. Sudbourne Cowship 6401 by Sudbourne Sunshine 3374.
 147 II. (£10).—SIR CUTHBERT QUILTER, BART., M.P., Methersgate Hall, Woodbridge, for Bawdsey Wealth 4309; s. Bawdsey Harvester 3076, d. Sunshine 6281 by Wilson's Conquest 2492.
 144 III. (£5).—ARTHUR T. PRATT, Morston Hall, Trimley, Ipswich, for Morston Alendale 4531, bred by William Allen, Harkstead, Suffolk; s. Darsham Sheik 4139, d. Stella 6313 by Neptune 3005.
 143 R. N.—JAMES HALES, Rougham, Bury St. Edmunds, for Rougham Marechal Niel.

Class 23.—*Suffolk Stallions, foaled in 1913.* [6 entries.]

- 148 I. (£15, & Champion).—KENNETH M. CLARK, Sudbourne Hall, Orford, Suffolk, for Sudbourne Beau-Brocade 4235; s. Sudbourne Beau Monde 3598, d. Sudbourne Tilly 6082 by Sudbourne Arabi 3287.
 151 II. (£10, & R. N. for Champion).—ARTHUR T. PRATT, Morston Hall, Trimley, Ipswich, for Morston Friday 4205, bred by R. H. Winch, Harkstead, Suffolk; s. Harvester 3076, d. Pride 6435 by Neptune 3005.
 150 III. (£5).—KENNETH M. CLARK, for Sudbourne Peter Pan 4214; s. Sudbourne Peter 3955, d. Sudbourne Beatrice 6372 by Sudbourne Arabi 3309.

Class 24.—*Suffolk Fillies, foaled in 1915.* [4 entries.]

- 155 I. (£15).—KENNETH M. CLARK, Sudbourne Hall, Orford, Suffolk, for Sudbourne Moonlight 8623; s. Sudbourne Peter 3955, d. Sudbourne Twilight 7219 by Sudbourne Arabi 3287.
 156 II. (£10).—SIR CUTHBERT QUILTER, BART., M.P., Methersgate Hall, Woodbridge, for Bawdsey Cleopatra 8638; s. Sudbourne Arabi 3287, d. Bawdsey Empress 7017 by Bawdsey Harvester 3076.
 154 III. (£5).—KENNETH M. CLARK, for Sudbourne Armada 8519; s. Sudbourne Peter 3955, d. Sudbourne Arabella 5472 by Smith's Wedgwood 149.

Class 25.—*Suffolk Fillies, foaled in 1914.* [2 entries.]

- 159 I. (£15).—KENNETH M. CLARK, Sudbourne Hall, Orford, Suffolk, for Sudbourne Dona 8201; s. Sudbourne Peter 3955, d. Sudbourne Dolly 5521 by Sudbourne Count 3257.
 158 II. (£10).—KENNETH M. CLARK, for Sudbourne Belinda 8256; s. Sudbourne Peter 3955, d. Sudbourne Bella 2nd 5904 by Sudbourne Count 3257.

Class 26.—*Suffolk Fillies, foaled in 1913.* [3 entries.]

- 161 I. (£15).—KENNETH M. CLARK, Sudbourne Hall, Orford, Suffolk, for Sudbourne Red Star 7833; s. Sudbourne Peter 3955, d. Sudbourne Red Queen 5554 by Sudbourne Count 3257.
 160 II. (£10).—KENNETH M. CLARK, for Sudbourne Bloom 7802; s. Sudbourne Arabi 3287, d. Sudbourne Blossom 5771 by Firefly 2477.
 162 III. (£5).—SIR CUTHBERT QUILTER, BART., M.P., Methersgate Hall, Woodbridge, for Bawdsey Judy 7887; s. Bawdsey Harvester 3076, d. Bawdsey Marionet 4335 by Prince Wedgwood 2384.

Class 27.—*Suffolk Mares, with Foals at foot.* [3 entries.]

- 164 I. (£15).—KENNETH M. CLARK, Sudbourne Hall, Orford, Suffolk, for Sudbourne Merrilass 7218, foaled in 1911; s. Dennington Oupbearer 3088, d. Sudbourne Mermaid 6012 by Sunshine 2734. [Foal by Sudbourne Arabi 3287.]
 165 II. (£10).—SIR CUTHBERT QUILTER, BART., M.P., Methersgate Hall, Woodbridge, for Bawdsey Jewel 6485, foaled in 1906, bred by the late Sir Cuthbert Quilter, Bart., M.P.; s. Sudbourne Count 3257, d. Sutton Ruby 5689 by Warrior 1938. [Foal by Bawdsey Hay 4188.]

¹ £50 towards these Prizes were given by the Suffolk Horse Society.

² The "Crownation" Silver Challenge Cup given by the Suffolk Horse Society for the best Stallion in Classes 21-23.

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]
 183 III. (£5.)—KENNETH M. CLARK, for Sudbourne Beatrice 8732, foaled in 1900, bred by Exhibitor; s. Sudbourne Arab 3309, d. Sudbourne Bessie 5501 by Dimple Dick 2497. [Foal by Sudbourne Bullman 4153.]

Class 28.—Suffolk Foals, the produce of Mares entered in Class 27. [3 entries.]

- 186 I. (£10.)—KENNETH M. CLARK, Sudbourne Hall, Orford, Suffolk, for colt, foaled March 18; s. Sudbourne Bellman 4153, d. Sudbourne Beatrice 8732 by Sudbourne Arab 3309.
 188 II. (£5.)—SIR OUTHBERT QUILTER, BART., M.P., Methersgate Hall, Woodbridge, for filly, foaled Feb. 5; s. Bawdsey Hay 4188, d. Bawdsey Jewel 648 by Sudbourne Count 3257.
 187 III. (£3.)—KENNETH M. CLARK, for colt, foaled March 4; s. Sudbourne Arabi 3287, d. Sudbourne Merrilass 7218 by Dennington Cupbearer 3086.

Hunters.¹

Class 29.—Hunter Colts or Geldings, foaled in 1915. [9 entries.]

- 172 I. (£15.)—GEORGE DICKINSON, Clark Mills, Clark-in-Cartmel, Lancs., for Clark Good Lad, bay colt, bred by John Turner, Beechwood Farm, Newton-le-Willows; s. Best Man, d. by Heathbird.
 174 II. (£10.)—JOHN LETT, Rillington, York, for Ace of Trumps, chestnut gelding, bred by D. Coates, Pickering; s. Fealsham.
 170 III. (£5.)—GEORGE E. CHURCHILL, 2 Cheapside, Fishponds, Bristol, for Whizzy Bang, bay colt; s. Christmas Greeting, d. Nora by Sea Fly.
 176 R. N.—LORD MIDDLETON, Birdsall House, Malton, Yorks., for Griffin.
 H. C.—175. C.—171.

Class 30.—Hunter Geldings, foaled in 1914. [6 entries.]

- 178 I. (£15.)—MAJOR SIR MERRIK R. BURRELL, BT., Knepp Castle, Horsham, Sussex, for Black Beauty (Supp. No. 341), black; s. The Best 147, d. Lovey Mary 4227 by Castlebrook 2.
 179 II. (£10.)—MAJOR L. B. HOLLIDAY, Oaklands, Kirkburton, near Huddersfield, for chestnut, breeder unknown; s. Vitez, d. Agate by Santol.
 180 III. (£5.)—CAPT. W. P. JEFFCOCK, West Common, Harpenden, for Forewarn, bay, bred by F. E. Bowser, Wigtoft, Boston, Lincs.; s. Splendour, d. Snowdrop 3rd 4434.
 182 R. N.—LORD MIDDLETON, Birdsall House, Malton, for Greeting.

Class 31.—Hunter Geldings, foaled in 1913. [4 entries.]

- 187 I. (£15.)—LORD MIDDLETON, Birdsall House, Malton, for Meteor (Supp. No. 344), chestnut; s. Jovial (vol. 20, p. 553 G.S.B.), d. Merry 4296 by Red Eagle (vol. 18, p. 432 G.S.B.).
 184 II. (£10.)—MAJOR SIR MERRIK R. BURRELL, BT., Knepp Castle, Horsham, Sussex, for King Richard (Supp. No. 307), bay; s. Dennis Richard (vol. 19, p. 821 G.S.B.), d. Surprise 3014 by Silver King 54.
 186 III. (£5.)—McMORRAN BROS., Aston Cottage, Nantwich, for Vindicator, brown, breeder unknown.

Class 32.—Hunter Fillies, foaled in 1915. [8 entries.]

- 188 I. (£15.)—CAPT. HON. HUGH BURDETT-MONEY-COUTTS, Stoodleigh Court, Tiverton, for Golden Girl 2nd 5233, chestnut; s. Golden Grebe (vol. 21, p. 365) d. Gaiety Girl 2nd 4195 by Newmarket (vol. 18, p. 84).
 192 II. (£10.)—CAPT. W. P. JEFFCOCK, West Common, Harpenden, for Britannia 2nd 5009, bay; s. Captain Jack 458, d. The Rootings 5100.
 194 III. (£5.)—J. NORBURY, Heathside, Knutsford, for chestnut; s. Sly Patrick (vol. 18, p. 616 G.S.B.), d. Wishful by Mountain Buck.
 193 R. N.—LORD MIDDLETON, Birdsall House, Malton, for Scornor.
 H. C.—180. C.—191.

Class 33.—Hunter Fillies, foaled in 1914. [6 entries.]

- 199 I. (£15, & R.N. for Champion.)—MAJOR L. B. HOLLIDAY, Oaklands, Kirkburton, near Huddersfield, for chestnut, breeder unknown; s. Oppressor, d. Tippytoes by General Symons.
 198 II. (£10.)—LT.-COL. DAVID DAVIES, M.P., Broneirion, Llandinam, Mont., for May 3rd 5231, grey, bred by the late J. G. Miller, Llwynmadoc, Mont.; s. Red Sahib 75.

¹ £50 towards these Prizes were given by the Hunters' Improvement and National Light Horse Breeding Society.

² Champion Gold Medal given by the Hunters' Improvement and National Light Horse Breeding Society for the best Filly not exceeding three years old, in Classes 32-34, which is registered in the Hunter Stud Book, or whose entry was tendered within a month of the Award.

Award of Live Stock Prizes at Manchester, 1916. lix

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 201 III. (£5.)—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for *Encore* 5037, brown, bred by W. B. Swallow, Wootton Lawn, Ulceby, Lincs.; s. Akbar (vol. 20, p. 897), d. *Repetition* 3879 by Wales (vol. 18, p. 854).
 196 R. N.—FRANK J. BURDETT, Court Farm, Billingshurst, for *Music* 2nd.
 H. C.—197. C.—200.

Class 34.—*Hunter Fillies, foaled in 1913.* [8 entries.]

- 206 I. (£15, & Champion.¹)—J. ROBERTSON, Ladyrig, Roxburgh, for *Wisdom*, dark brown; s. *Be Very Wise*, d. *Rosa Mohr* by Charlton Grange.
 209 II. (£10.)—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for *Ranee*, bay, bred by Mrs. H. D. Greene, Grove, Craven Arms, Salop; s. *Red Sahib* 75.
 202 III. (£5.)—CAPTAIN OLIVE BEERENS, Swinton Grange, Malton, for *Larkspur* 4935, brown; s. *Jovial* (vol. 20, p. 553 G.S.B.), d. *Whinflower* 8801 by *The Hero* (vol. 18, p. 83 G.S.B.).
 205 E. N.—MAJOR SIR MERRIK R. BURRELL, BT., Knepp Castle, Horsham, for *Hannah* 3rd.
 H. C.—204. C.—203.

Class 35.—*Hunter Mares (Novice), foaled in or after 1908, with Foals at foot, up to from 12 to 14 stone.* [4 entries.]

- 210 I. (£15.)—ARTHUR S. BOWLBY, Gilt-on Park, Harlow, Essex, for *War Lady* 3798, bay, foaled 1909, bred by Gilbert Robinson, Hinwick Hall, Wellingborough; s. *Red Sahib* 75, d. *Beilona* 3285 by *Thurles* (vol. 17, p. 788 G.S.B.). [Foal by *Captain Jack* (vol. 21, p. 723)].
 211 II. (£10.)—WILLIAM R. CLARKE, Debden Hall Stud Farm, Loughton, Essex, for *Essex Gem*, brown, foaled in 1912; s. *Morgendale*, d. *Sapphire Blue* by *Iain*. [Foal by *Explorer*.]

Class 36.—*Hunter Mares (Novice), foaled in or after 1908, with Foals at foot, up to more than 14 stone.* [3 entries.]

- 214 I. (£15, & R. N. for Champion.²)—H. D. SPENCELY, Vennwood, Marden, Hereford, for *Semiramis*, late Ososureh 4598, chestnut, foaled in 1908. [Foal by *Ampelion*.]
 216 II. (£10.)—EDWARD JOHNSON, Greaves Stables, Lancaster, for *Lady Kildare*, chestnut, foaled in 1911, breeder unknown. [Foal by *Underbred*.]

Class 37.—*Hunter Mares with Foals at foot, up to from 12 to 14 stone.* [15 entries.]

- 228 I. (£15.)—H. D. SPENCELY, Vennwood, Marden, Hereford, for *Eileen Oge* 5083, chestnut, foaled in 1905, breeder unknown; s. *Royal Bow* (vol. 19, p. 140), d. *Athelina* by *Atheling* (vol. 15, p. 650). [Foal by *Ampelion*.]
 231 II. (£10.)—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for *Shebeen* 4252, chestnut, foaled in 1904, bred by J. G. Muir, Brigstock, Thrapston; s. *Barsac* (vol. 18, p. 614 G.S.B.), d. *Heather* by *St. Jerome*. [Foal by *Indian Runner* (vol. 21, p. 825 G.S.B.).]
 223 III. (£5.)—LORD MIDDLETON, Birdsall House, Malton, for *Bairgen Breac* (vol. 20, p. 704 G.S.B.), black, foaled in 1905, bred by Sir Peter Walker; s. *The Baker*, d. *Rupee* by *Silver*. [Foal by *Benvenuto*.]
 217 IV. (£2.)—MISS IRENE AUSTIN, Licky Grange, Bromsgrove, for *Lady Edwardine* (vol. 21, p. 213 G.S.B.), chestnut, foaled in 1904, bred by G. Edwardes; s. *Uncle Mac*, d. *Edwardine* by *Duke of Portland*. [Foal by *Christmas Greeting*.]
 221 E. N.—HENRY JAMES KING, Poles, Ware, Herts, for *Lorna Doone*.
 H. C.—220. C.—227.

Class 38.—*Hunter Mares with Foals at foot, up to more than 14 stone.* [8 entries.]

- 239 I. (£15, & Champion.³)—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for *Stormy Petrel* 2nd 4186, brown, foaled in 1905, bred by the late R. G. Oarden, Fishmoynce, Borrisoleigh, Co. Tipperary; s. *Faute-de-Mieux* (vol. 18, p. 587 G.S.B.), d. *Wild Duck* 3031 by *King Otto* (vol. 18, p. 780 G.S.B.). [Foal by *Cyclops* 2nd.]
 234 II. (£10.)—MAJOR SIR MERRIK R. BURRELL, BT., Knepp Castle, Horsham, for *Surprise* 3014, bay brown, foaled in 1902, bred by Lieut.-Col. Z. Walker, Acock's Green; s. *Silver King* 54, d. *My Treasure* (vol. 22, p. 600 G.S.B.) by *Hidden Treasure*. [Foal by *Hanover Square*.]

¹ Champion Gold Medal given by the Hunters' Improvement and National Light Horse Breeding Society for the best Filly not exceeding three years old, in Classes 32-34, which is registered in the Hunter Stud Book, or whose entry was tendered within a month of the Award.

² Champion Gold Medal given by the Hunters' Improvement and National Light Horse Breeding Society for the best Mare, four years and upwards, in Classes 35-38 which is registered in the Hunter Stud Book, or whose entry was tendered within a month of the Award.

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 233 III. (£5.)—MAJOR SIR MERRIK R. BURRELL, BT., for *Lovely Mary* 4247, brown, foaled in 1900, bred by the Earl of Lonsdale, Barleythorpe, Oakham; s. *Castlenock* 3, d. *Sister Mary* 3005 by *Brown Prince* (vol. 15, p. 601, G.S.B.) [Foal by *Hanover Square*.]
 237 R. N.—MRS. SCOTT, Oaklands, Riding Mill, for *Duchess* 12, late *Mayblossom*.
 H. C.—232. C.—232.

Class 39.—*Hunter Colt Foals, the produce of Mares in Classes 35 to 38.* [12 entries.]

- 245 I. (£10.)—LORD MIDDLETON, Birdsall House, Malton, for bay, foaled April 23; s. *Benvenuto*, d. *Boirgen Breac* by *The Baker*.
 241 II. (£5.)—MAJOR SIR MERRIK R. BURRELL, BT., Knepp Castle, Horsham, for bay, foaled May 5; s. *The Best* 147, d. *Coronation* 2nd 4338 by *Hanover Square*.
 251 III. (£3.)—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for chestnut, foaled March 15; s. *Indian Runner*, d. *Shubeen*.
 247 R. N.—MRS. SCOTT, Oaklands, Riding Mill, Northumberland.
 H. C.—248. C.—242.

Class 40.—*Hunter Filly Foals, the produce of Mares in Classes 35 to 38.* [16 entries.]

- 267 I. (£10.)—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for brown, foaled April 15; s. *Cyclops* 2nd d. *Stormy Petrel* 2nd, 4186 by *Faut-de-Mieux* (vol. 13, p. 537 G.S.B.).
 256 II. (£5.)—MAJOR SIR MERRIK R. BURRELL, BT., Knepp Castle, Horsham, for bay, foaled March 28; s. *Hanover Square*, d. *Surprise* 3014 by *Silver King* 54.
 263 III. (£3.)—LORD MIDDLETON, Birdsall House, Malton, for chestnut, foaled March 8; s. *Jovial*, d. *Scruple* by *Red Eagle*.
 255 R. N.—MAJOR SIR MERRIK R. BURRELL, BT., for *Summer Time*.
 H. C.—259. C.—253, 265.

Polo and Riding Ponies.¹

Class 41.—*Polo and Riding Pony Colts, Fillies or Geldings, foaled in 1915.* [6 entries.]

- 269 I. (£10.)—TRESHAM GILBEY, Whitehall, Bishop's Stortford, for *Goodward* (Supp. 1915), bay colt; s. *Right Forard* 368, d. *Good Girl*.
 273 II. (£5.)—NOEL H. WILLS, Miserden Park, Cirencester, for *Winter Morning* (Supp. 1915), bay colt, bred by the Executors of the late Sir John Barker, Bt., Bishop's Stortford; s. *Right Forard* 368, d. *Silk* 1630.
 271 III. (£3.)—G. NORRIS MIDWOOD, The Grange, North Rode, Congleton, for *Sincerity* (Supp. 1915), bay filly, bred by Sir Gilbert Greenall, Bt., Walton Hall, Warrington; s. *Victory* 2nd 665, d. *Yours Truly* 2096 by *Royal Rosebud* (Supp. 1902).
 272 R. N.—MISS GWENTH W. SAMUEL, Woodbank Hall, Chester, for *Sholwick Chief*.
 H. C.—270. C.—268.

Class 42.—*Polo and Riding Pony Colts, Fillies or Geldings, foaled in 1914.* [6 entries.]

- 274 I. (£10.)—J. WILLIS FLEMING, Stoneham Park, Eastleigh, Hants, for *Sir Roger* (Supp. 1914-1915), chestnut colt; s. *Right Forard* 368, d. *Romance* 2nd 2824 by *Rajah* 417.
 277 II. (£5.)—G. NORRIS MIDWOOD, The Grange, North Rode, Congleton, for *Colleen* 4th (Supp. 1914-1915), bay filly; s. *Chief Butler* 732, d. *Sligo* 2nd 2534.
 275 III. (£3.)—TRESHAM GILBEY, Whitehall, Bishop's Stortford, for *Good Boy* (Supp. 1915), chestnut gelding; s. *Right Forard* 368, d. *Good Girl*.
 279 R. N.—C. HOWARD TAYLOR, Middlewood Hall, Barnsley, for *Plume*.

Class 43.—*Polo and Riding Pony Stallions, foaled in or before 1913, not exceeding 15 hands.* [10 entries.]

- 289 I. (£10. & Champion.²)—NOEL H. WILLS, Miserden Park, Cirencester, for *Cherry Tint* 761, chestnut, foaled in 1907, bred by Messrs. Young; s. *Cherry Tree*, d. *Marco-tint* (vol. 22, p. 520 G.S.B.), by *Marco*.
 280 II. (£5. & R. N. for Champion.²)—W. BALDING, Eastfield, Hillmorton, Rugby, for *Christopher Columbus* 764, bay, foaled in 1910, bred by J. E. B. Baillie; s. *Mark Forard*, d. *Little Chris* by *Bentworth*.

¹ £25 towards these Prizes were given by the National Pony Society.

² Champion Gold Medal given by the National Pony Society for the best Stallion or Colt in Classes 41-43.

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 284 **III. (£3).**—G. NORRIS MIDWOOD, The Grange, North Rode, Congleton, for Little Corona (Supp. 1916), dark brown, foaled in 1912, bred by B. Kirby; s. Morgamatic, d. Smoke.
- 287 **R. N.**—JAMES MUMFORD, Stud Farm, Knightcote, Leamington Spa, for Prairie Fire. H. C.—286. C.—281.

Class 44.—*Polo and Riding Pony Fillies or Geldings, foaled in 1913.* [4 entries.]

- 292 **I. (£10).**—RICHARD PAYNE, Newhill Hall, West Melton, Rotherham, for Duchess 5th (Supp. 1914) bay filly; s. Field Marshal 512, d. Polo 6318.
- 291 **II. (£5).**—TRESHAM GILBEY, Whitehall, Bishop's Stortford, for Naughty Girl (Supp. 1914), chestnut filly; s. Right Forard 368, d. Good Girl.
- 290 **III. (£3).**—TOM C. ARMITAGE, The Oaks, Chorley, Lancs., for Jest, chestnut filly; s. Hon. Jummy (vol. 20, p. 1109 G.S.B.), d. Kittlen 4th 2841 by Sir Patrick (vol. 18, p. 747 G.S.B.).
- 293 **R. N.**—O. HOWARD TAYLOR, Middlewood Hall, Barnsley, for Kate Selby.

Class 45.—*Polo and Riding Pony Mares, with Foals at foot, not exceeding 14·2 hands.* [8 entries.]

- 297 **I. (£10, & Champion.¹)**—M. J. KINGSCOTE, Ooxwell House, Faringdon, Berks, for Gwynedd 2562, chestnut, foaled in 1909, bred by V. T. Taylor, Steinbrook House, Chippenham, Wilts.; s. Wales (vol. 18, p. 851), d. Crosofo. [Foal by Bagotstown.]
- 295 **II. (£5, & R. N. for Champion.¹)**—CAPT. J. S. BAKEWELL, Gromhall, Charnfield, Glos., for Robbery 2571, chestnut, foaled in 1905; bred by J. H. Griffiths, Crickmail, Pembroke; s. Gold Medallist (vol. 20, p. 1022 G.S.B.), d. by Princecraft. [Foal by Darigul.]
- 298 **III. (£3).**—G. NORRIS MIDWOOD, The Grange, North Rode, Congleton, for Elsie 2987, bay, foaled in 1908, breeder unknown. [Foal by Victory 2nd 665.]
- 300 **R. N.**—O. HOWARD TAYLOR, Middlewood Hall, Barnsley, for Calceolaria. H. C. & B. M.²—296. C.—301.

Cleveland Bays or Coach Horses.

Class 46.—*Cleveland Bay or Coaching Stallions, any age.* [5 entries.]

- 303 **I. (£10).**—JOHN LERT, Cleveland Stud Farm, Billington, York, for Billington Victor 2536 (Coaching), foaled in 1910, bred by William Wood, Biladale, Helmley; s. Breaston Prince 2451, d. Queen's Rocket 948 by Prince of the Dales (Cleveland Bay).
- 302 **II. (£5).**—JOHN LERT, for Billington Resolute (Coaching), foaled in 1913, bred by James Tebb, Scagglethorpe, Malton; s. Cholderton Luck 2517, d. Polly by Huby Prince 2145.
- 304 **III. (£3).**—J. W. LERT, Scagglethorpe Manor, Malton, for Billington Truefit 2579 (Coaching), foaled in 1913, bred by William Slater, Harome, Newton, Yorks.; s. Breaston Prince 2451, d. Lady Marjorie 1083 by Beadlam Prince 2348.
- 305 **R. N.**—GEORGE SOOBY, Bendlam Grange, Newton, Yorks, for Wonderful.

Class 47.—*Cleveland Bay or Coaching Mares, with Foals at foot.* [2 entries.]

- 307 **I. (£10).**—J. W. LERT, Scagglethorpe Manor, Malton, for Stillingfleet Princess 1210 (Coaching), foaled in 1911, bred by Edward Gooderick, Stillingfleet, York; s. Yorkshire Gentleman 2254, d. Gooderick's Violet 827 by Prince Victor 376. [Foal by Billington Progress 1725.]
- 308 **II. (£5).**—JOHN WEBSTER, Cross House, Harome, Newton, Yorks., for Harome Beauty 1182 (Coaching), foaled in 1910, bred by George Burton, Thorpe Willoughby, Selby; s. Breaston Prince 2451, d. Bello of Harome 2nd 1105 by Lord Mischief 2282. [Foal by Knight of the Garter 2460.]

Hackneys.

Class 48.—*Hackney Stallions, foaled in 1915.* [2 entries.]

- 310 **I. (£10).**—HENRY B. BRANDT, Capenor, Nutfield, Surrey, for Capenor Killada, chestnut; s. King's Proctor 11102, d. Pola 20156 by Polonius 4931.
- 309 **II. (£5).**—ERNEST BEWLEY, Danum, Rathgar, co. Dublin, for Danum Potean, chestnut; s. King's Proctor 11102, d. Oruskeen Laun 21945 by Terrington Recruit 9463.

¹ Champion Gold Medal given by the National Pony Society for the best Mare or Filly in Classes 41, 42, 44, and 45.

² Bronze Medal given by the National Pony Society for the best Foal in Class 45, entered or eligible for entry in the Supplement to the National Pony Stud Book.

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 49.—Hackney Stallions, foaled in 1914. [3 entries.]

- 313 I. (£10.)—SIR LEES KNOWLES, BT., C.V.O., Westwood, Pendlebury, Manchester, for Salford Victor 12918, chestnut; s. Hopwood Viceroy 9280, d. Knowle Haima 13633 by His Majesty 2513.
 311 II. (£5.)—ERNEST BEWLEY, Danum, Rathgar, co. Dublin, for Danum Ballyowen 12829, chestnut; s. Polonius 4931, d. Sprightly Clara 21041 by Royal Danegelt 5785.
 312 III. (£3.)—GEORGE A. COBB, Woodside, Garston, Herts., for Garston Proctor 12843, black chestnut; s. King's Proctor 11102, d. Hopwood Madge 22073 by Copmanthorpe Performer 0870.

Class 50.—Hackney Stallions, foaled in or before 1913. [6 entries.]

- 319 I. (£10, & Champion.¹)—W. W. RYOROFF, Drake Hill Stud Farm, Bingley, for Hopwood King 11804, chestnut, foaled in 1910, bred by Sir Lees Knowles, Bt., Westwood, Pendlebury; s. Admiral Orlington 9578, d. Ryburn Lucinda 17698 by Ganymede 2076.
 318 II. (£5, & R. N. for Champion.¹)—WALTER BRIGGS, Linden Hall, Borwick, Carnforth, for Garston Leopard 12368, chestnut roan, foaled in 1912, bred by George A. Cobb, Woodside, Garston, Watford; s. Leopard 9783, d. Terrington Blue Stocking 19861 by Caxton 2398.
 314 III. (£3.)—JOHN BEAL, Cowlam Manor, Sledmere, Malton, for Blanch King Edward 12315, dark chestnut, foaled in 1912; s. King of the East 10725, d. Blanch Gay Girl 18029 by Hummanby Duke 7877.
 317 R. N.—MRS. FLETCHER & SONS, The Grange, Angram, York, for Angram Dictator. O.—316, 318.

Class 51.—Hackney Fillies, foaled in 1915. [3 entries.]

- 320 I. (£10.)—A. BROMBY, Hart Lane, West Hartlepool, for Baby Beatty, chestnut; s. Nugget 8862, d. Dame Belle 17241 by Result 8873.
 321 II. (£5.)—H. O. CALLABY, Hunstanton, Norfolk, for Hunston Briar, dark chestnut; s. Leopard 9783, d. Bright Maid 11864 by Ganymede 2076.
 322 III. (£3.)—MRS. FLETCHER & SONS, The Grange, Angram, York, for Angram Majesty's Princess, bay; s. Angram Majesty 11967, d. Eastern Queen 16586 by Marshal Blucher 4398.

Class 52.—Hackney Fillies, foaled in 1914. [5 entries.]

- 323 I. (£10, & Champion.²)—ERNEST BEWLEY, Danum, Rathgar, co. Dublin, for Adbolton Bountiful 23834, chestnut, bred by A. W. Hickling, Adbolton, Nottingham; s. Mathias 6473, d. Towthorpe Iris 19618 by Forest Star 7445.
 326 II. (£5.)—H. V. SHERINGHAM, South Crenke, Fakenham, for Creake Lady 23912, chestnut; s. Antonius 10559, d. Creake Connie 18130 by Manfield 5301.
 324 III. (£3.)—WALTER BRIGGS, Linden Hall, Borwick, Carnforth, for Albin Bounteous 23839, chestnut; s. Albin Wildfire 10551, d. Terrington Baroness 13965 by Caxton 2398.
 327 R. N.—GEORGE A. SMITH, East View, Oakington, Cambs., for Oakington Ring O' Bell.

Class 53.—Hackney Fillies, foaled in 1913. [3 entries.]

- 330 I. (£10, & R. N. for Champion.²)—JOHN MAKEAGUE, Golborne Park, Newton-le-Willows, for Slashing Dorothy 23721, chestnut, bred by the late Sir Walter Gilbey, Bt., Elsenham Hall, Essex; s. Antonius 10559, d. Flash Dorothy 19088 by Forest Star 7445.
 328 II. (£5.)—MRS. FREDERICK R. COLMAN, Nork Park, Epsom Downs, for Crystal of Nork 23510, brown; s. Mathias 6473, d. Alla-Breve 18863 by All Serene 8346.
 329 III. (£3.)—JOHN MAKEAGUE, for Pious Princess 23728, chestnut; s. King's Proctor 11102, d. Pious Bonds 16103 by Polonius 4931.

Class 54.—Hackney Mares, with Foals at foot, over 14 hands. [4 entries.]

- 333 I. (£10.)—SIR LEES KNOWLES, BT., C.V.O., Westwood, Pendlebury, Manchester, for Knowle Haima 13633, black chestnut, foaled in 1898, bred by the late R. Simpson, Ashfield, Market Weighton; s. His Majesty 2513, d. Lady Buckrose 2875 by Pioneer 1088. [Foal by Garton Duke of Connaught 3009.]
 331 II. (£5.)—CHARLES CLARK, Hotel Metropole, Blackpool, for Quality Girl 22194, chestnut, foaled in 1910; s. Polonius 4931, d. Dashing Dunham 16558 by Bonny Danegelt 6990. [Foal by King's Proctor 11102.]
 332 III. (£3.)—W. GREENWOOD, Gledhow Hall Farm, Ledgett Lane, Roundhay, Leeds, for Abigail 21204, chestnut roan, foaled in 1909, bred by Robert Whitworth, Lonsborough Stud, Market Weighton; s. Polonius 4931, d. Lady Superior 12033 by Garton Duke of Connaught 3009. [Foal by Hopwood King 11804.]
 334 R. N.—ALFRED SIMPSON, Allerthorpe, York, for Allerthorpe Princess.

¹ Champion Gold Medal given by the Hackney Horse Society for the best Stallion in Classes 49-50.

² Champion Gold Medal given by the Hackney Horse Society for the best Mare or Filly in Classes 51-54.

Award of Live Stock Prizes at Manchester, 1916. lxiii

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Hackney Ponies.

Class 55.—Hackney Pony Stallions, foaled in or before 1913, not exceeding 14 hands. [3 entries.]

- 335 I. (£10.)—JOSHUA BALL, Southworth Hall, Warrington, for Southworth Swell 11219, bay, foaled in 1907, bred by E. W. Sankey, Croft, Warrington; s. Pinderfields Horace 7952, d. Tilston Maid 18278 by Berkeley Model 3683.
337 II. (£5.)—ALFRED C. KING, Braishfield Manor, Romsey, Hants, for Harviestoun Wattie 11463, dun, foaled in 1909, bred by J. E. Kerr, Harviestoun Castle, Dollar; s. Sir Archie 10425, d. Little Warren 18366 by Juhus Cæsar 2nd 5866.
338 III. (£3.)—W. H. BONNER, Bicester, for Blacon Sparrow 11987, chestnut, foaled in 1910, bred by L. P. Smith, Blacon Point, Chester; s. Merry Duke 7555, d. Blacon Merrylegs 22404 by Fire Boy 7440.

Class 56.—Hackney Pony Mares, with Foals at foot, not exceeding 14 hands. [1 entry.]

- 338 I. (£10.)—JAMES HALES, Rougham, Bury St. Edmunds, for Berry Midget 18181, bay, foaled in 1902, bred by W. Hollins, Berry Hill, Mansfield, Notts.; s. Pro-pector 6516, d. Grovehill Midget 13530 by Matchless of Langton 5722. [Foal by Son of Fire 9023.]

Shetland Ponies.

Class 57.—Shetland Pony Stallions, foaled in or before 1913, not exceeding 10½ hands. [9 entries.]

- 342 I. (£10.)—MRS. ETTA DUFFUS, Penniwells, El-treo, for Vagary of Penniwells, black, foaled in 1912, bred by The Ladies Hope, Bodiam, Sussex; s. Helium 452, d. Viola 2168 by Oman 33.
346 II. (£5.)—WILLIAM MUNGALL, Transy, Dunfermline, for Pat of Transy, black, foaled in 1912; s. Silvertown of Transy 519, d. Princess Patricia 2559 by Peace 325.
347 III. (£3.)—WILLIAM MUNGALL, for Selwood of Transy 619, black, foaled in 1908; s. Seaweed 333, d. Stella 1892 by Thor 83.
343 R. N.—MRS. HOBART, West Cliff War Hospital, Hythe, Southampton, for Ivanhoe. H. C.—340. O.—345.

Class 58.—Shetland Pony Mares, with Foals at foot, not exceeding 10½ hands. [10 entries.]

- 354 I. (£10.)—R. W. R. MACKENZIE, Earls Hall, Leuchars, Fife, for Norma of Whitehall 3103, black, foaled in 1909, bred by William Parkin-Moore, Whitehall, Mealsgate, Cumberland; s. Excellent 148, d. Nancy 1132 by Lord of the Isles 28. [Foal by Bessbrook of Earls Hall 397.]
350 II. (£5.)—MRS. ETTA DUFFUS, Penniwells, Elstree, for May Queen of Penniwells, black, foaled in 1911; s. Dante of Coalville 444, d. Mayfly of Penniwells 2582 by Glencairn 314. [Foal by Remus.]
349 III. (£3.)—MRS. ETTA DUFFUS, for Maydew of Penniwells, black, foaled in 1912; s. Dragon of Earls Hall 505, d. Mayfly of Penniwells 2582 by Glencairn 314. [Foal by Remus.]
352 R. N.—SIR W. H. LEVER, BT., Thornton Manor, Thornton Hough, Cheshire, for Una of Uyasound. H. C.—356. O.—348.

Welsh Mountain Ponies.¹

Class 59.—Welsh Mountain Pony Stallions, foaled in 1913, not exceeding 11½ hands, or in 1914, not exceeding 11½ hands. [3 entries.]

- 359 I. (£10.)—MRS. H. D. GREENE, Grove, Craven Arms, for Grove Elfin 729, grey, foaled in 1913; s. Grove Ballwhite 200, d. Grove Fairy 2531.
358 II. (£5.)—DAVID DAVIES & SONS, Blaenpistyll Stud Farm, Cardigan, for Seren Cymru Star of Wales, red roan, foaled in 1913; s. Cymru Sydd 551, d. Pistyll Rosnett 4149 by Golden Gleam 212.
360 III. (£3.)—T. B. LEWIS, Bronallt, Llanwrttyd Wells, for Ap Cream of Epyynt, chestnut, foaled in 1913; s. Cream of Epyynt 344, d. Jenny Wren 3325 by Count Llwyd 435.

Class 60.—Welsh Mountain Pony Stallions, foaled in or before 1912, not exceeding 12 hands. [5 entries.]

- 361 I. (£10, & Champion.²)—MRS. H. D. GREENE, Grove, Craven Arms, for Bleddfa Shooting Star 73, grey, foaled in 1901, bred by S. H. Wilmoth, The Chalet, Alveston, Glos.; s. Dyoll Starlight 4, d. Alveston Belle 572 by Cymro.

¹ £24 towards these Prizes were given by the Welsh Pony and Cob Society.

² Champion Silver Medal and Certificate given by the Welsh Pony and Cob Society for the best Stallion in Classes 59 and 60, entered or accepted for entry in the Welsh Pony Stud Book.

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 362 II. (£5. & R. N. for Champion.¹)—MRS. H. D. GREENE, for Grove King Cole 2nd 505, iron grey, foaled in 1911; s. Grove King Cole 197, d. Bledfa Tell Tale 913 by Tyrant 477.
 363 III. (£3.)—MRS. STANLEY HOWARD, The Hall, Mount Charles, Co. Donegal, for Captain Hook, grey, foaled in 1912; s. Shooting Star 73, d. Miss Wynn.
 Class 61.—*Welsh Mountain Pony Fillies, foaled in 1913, not exceeding 11·8 hands, or in 1914, not exceeding 11·2 hands.* [1 entry.]

[No award.]

Class 62.—*Welsh Mountain Pony Mares, foaled in or before 1912, with Foals at foot, not exceeding 12 hands.* [4 entries.]

- 367 I. (£10, & Champion.¹)—MRS. H. D. GREENE, Grove, Craven Arms, for Nantylarn Starlight 2307, grey, foaled in 1903, bred by H. Maurice Lloyd, Delfryn, Llanwrda; s. Dyoll Starlight 4. [Foal by Grove King Cole 2nd 563.]
 369 II. (£5, & R. N. for Champion.²)—MRS. PHILIP HUNLOCK, Bucknell Manor, Bicester, for chestnut, foaled in 1912; s. Coronation Starlight, d. Cardigan Princess by Fiddlen Flyer. [Foal by Grove Fidler 564.]
 370 III. (£3.)—T. B. LEWIS, Bronallt, Llanwrtyd Wells, for Saren Epyynt 4525, chestnut roan, foaled in 1907, bred by D. Pwytherch, Maesron Farm, Llangammarch Wells. [Foal by Dyoll Starlight 4.]

Hunter Riding Classes.³

Class 63.—*Hunter Mares or Geldings, foaled in or before 1912, up to from 12 to 14 stone.* [15 entries.]

- 375 I. (£15.)—JOHN DRAGE, Chapel Brampton, Northampton, for Call Boy, bay gelding, foaled in 1909.
 374 II. (£10.)—JOHN DRAGE, for Blue Beard, bay gelding, foaled in 1910.
 385 III. (£5.)—MAJOR W. F. WAILES FAIRBURN, Askham Grange, York, for Caravan, chestnut gelding, foaled in 1912; s. Holiday House, d. Esterbelle by Esterling.
 373 R. N.—B. DAVIES, Yeaton, Baschurch, Salop, for Tango.
 H. C.—381. O.—372.

Class 64.—*Hunter Mares or Geldings, foaled in or before 1912, up to more than 14 stone.* [10 entries.]

- 392 I. (£15, & Champion.¹)—McMORRAN BROS., Aston Cottage, Nantwich, for Imperial, brown gelding, foaled in 1910.
 387 II. (£10, & R. N. for Champion.²)—JOHN DRAGE, Chapel Brampton, Northampton, for Grey Tick, bay gelding, foaled in 1911.
 390 III. (£5.)—GEOFF. KENYON, Plainville, Haxby, York, for Charlie Chaplin, bay gelding, foaled in 1910.
 388 R. N.—C. C. ELLISON, Monckton, Barnsley, Yorks., for Torpedo.
 H. C.—393. O.—389.

Class 65.—*Hunter Mares or Geldings, foaled in or before 1911, up to from 12 to 13·7 stone.* [11 entries.]

- 375 I. (£20.)—JOHN DRAGE, for Call Boy. (See Class 63.)
 373 II. (£15.)—B. DAVIES, Yeaton, Baschurch, Salop, for Tango, bay gelding, foaled in 1909.
 381 III. (£10.)—J. K. H. STEVENSON, The Warren, Finmere, Buckingham, for Top Hole, chestnut gelding, foaled in 1911, bred by W. H. Brown, Slingsby, Yorks.; s. Chockbird.
 398 IV. (£5.)—McMORRAN BROS., Aston Cottage, Nantwich, for Vertebra, chestnut mare, foaled in 1907, bred by Dr. Dundee, Redhall, Ballycorry, Co. Antrim; s. Thorax, d. Vera 2nd by Albert Victor.
 372 V. (£3.)—W. H. BURDON, Hartford House, Bedlington, Northumberland, for Richard (Supp. 280), chestnut gelding, foaled in 1911, bred by T. & H. Ward, Almsford Bank, Harrogate; s. Denis Richard, d. Ladylike by Markham.
 380 R. N.—McMORRAN BROS., for Golden Nugget.

¹ Champion Silver Medal and Certificate given by the Welsh Pony and Cob Society for the best Stallion in Classes 59 and 60, entered or accepted for entry in the Welsh Pony Stud Book.

² Champion Silver Medal and Certificate given by the Welsh Pony and Cob Society for the best Mare or Filly in Classes 61 and 62, entered or accepted for entry in the Welsh Pony Stud Book.

³ Prizes given by the Manchester Local Committee.

⁴ Gold Challenge Cup given by gentlemen interested in Hunters, for the best Mare or Gelding in Classes 63-67.

Award of Live Stock Prizes at Manchester, 1916. lxv

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 66.—Hunter Mares or Geldings, foaled in or before 1911, up to more than 13·7 and not more than 15 stone. [12 entries.]

- 387 I. (£20).—JOHN DRAGE for Grey Tick. (See Class 64)
 374 II. (£15).—JOHN DRAGE, for Blue Beard. (See Class 63.)
 390 III. (£10).—GEOFF. KENYON, for Charlie Chaplin. (See Class 64)
 391 IV. (£5).—MCMORRAN BROS., Aston Cottage, Nantwich, for Captured, brown gelding, foaled in 1910.
 393 V. (£3).—J. K. H. STEVENSON, The Warren, Finmere, Buckingham, for Syntax (Supp. 148), chestnut gelding, foaled in 1909, bred by Lord Middleton, Birdall House, Malton; s. Wales, d. Sympathy 2531 by Gordon.
 386 R. N.—R. A. BOWRING, Rockhill, Keynsham, Somerset, for Autumn Leaf.
 H. C.—402.

Class 67.—Hunter Mares or Geldings, foaled in or before 1911, up to more than 15 stone. [7 entries.]

- 392 I. (£20).—MCMORRAN BROS. for Imperial. (See Class 64.)
 404 II. (£15).—JOHN DRAGE, Chapel Brampton, Northampton, for Dorando, bay gelding, foaled in 1909.
 388 III. (£10).—C. O. ELLISON, Monckton, Barnsley, Yorks., for Torpedo, bay gelding, foaled in 1911.
 405 IV. (£5).—CAPT. W. P. JEFFCOCK, West Common, Harpenden, for Hawthorne (Supp. 168), grey gelding, foaled in 1910, bred by F. E. Bowser, Wigtoft, Boston, Lincs.; s. Splendour, d. Snowdrop 8rd 4434.
 389 V. (£3).—MAJOR L. B. HOLLIDAY, Oaklands, Kirkburton, Huddersfield, for O'Ryan, bay gelding.
 395 R. N.—T. & H. WARD, Pinchinthorpe, Guisborough, for Sportsman.

Hacks and Riding Ponies.

Class 68.—Mares or Geldings, foaled in or before 1912, not exceeding 12·2 hands. To be ridden by children born in or after 1904. [5 entries.]

- 407 I. (£10).—W. H. BONNER, Bicester, for Black Diamond, black mare, foaled in 1909.
 411 II. (£5).—H. TATHAM WALTER, Hinton Hall, Shrewsbury, for Silversaye, grey gelding, foaled in 1910.
 409 III. (£3).—A. E. LAWLEY, Forest Hey, Sandiway, Cheshire, for Kitty, grey mare, foaled in 1911.
 410 R. N.—MASTER G. D. MUCKLOW, Wood Hall, Bury, Lancs., for Lads-Love.
 C.—408.

Class 69.—Mares or Geldings, foaled in or before 1912, over 12·2 and not exceeding 13·2 hands. To be ridden by children born in or after 1902. [4 entries.]

- 415 I. (£10).—MISS MILDRED G. PASCOE, Pengilly, Barton Breage, Helston, Cornwall, for Trixie, brown mare, foaled in 1908, bred by William Cardell, Bosworgie, St. Erth, Hayle, Cornwall; s. Douglas, d. Dot.
 412 II. (£5).—W. H. BONNER, Bicester, for Black Pearl, black mare.
 414 III. (£3).—MISS O. CONSTANCE GRIFFITHS, Heath Hey, Hooton, Cheshire, for Nora, brown mare, foaled in 1908.
 413 R. N.—W. W. BOURNE, Garston Manor, Watford, for Coquette.

Class 70.—Mares or Geldings, foaled in or before 1912, over 13·2 and not exceeding 15 hands. [11 entries.]

- 420 I. (£10, & R. N. for Champion.¹)—MRS. M. J. KINGSOOTE, Coxwell House, Faringdon, Berks., for Vixen, chestnut mare, foaled in 1902.
 423 II. (£5).—MRS. ARTHUR SOWLER, The Warren, Finmere, Buckingham, for Bought and Paid For, brown mare, foaled in 1911, bred by Mr. Salmon, Brackley, Northants; s. St. Andrew.
 422 III. (£3).—O. FEILDEN MOSLEY, Leasingham, Sleaford, Lincs., for Travelling Boy, bay gelding, foaled in 1911, bred by the late Robert Earl, Rushington, Sleaford; s. Travelling Lad.
 424 R. N.—R. H. STOOKDALE, Cottingham House, Retford, for The Bat.

Class 71.—Mares or Geldings, foaled in or before 1912, over 15 hands. [7 entries.]

- 399 I. (£10, & Champion.¹)—MRS. V. H. RICHARDSON, The Hall, Eaglescliffe, R.S.O., Co. Durham, for Red Drake, chestnut gelding, foaled in 1910, bred by J. Elliott, Weaverthorpe, Yorks.; s. Green Drake.

¹ Gold Challenge Cup, given by gentlemen interested in Hacks and Riding Ponies, for the best Animal in Classes 68-71.

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 400 II. (£5.)—MRS. SCOTT, Oaklands, Riding Mill, Northumberland, for *The Beetle*, black gelding, foaled in 1900.
 381 III. (£3.)—J. K. H. STEVENSON, for *Top Hole*. (See Class 85.)
 428 R. N.—GEOFF. KENYON, Plainville, Haxby, York, for *Eve*.
 H. C.—386. C.—398, 427.

Driving Classes.¹

Class 72.—Harness Mares or Geldings, not exceeding 14 hands. [7 entries.]

- 433 I. (£10.)—W. W. BOURNE, Garston Manor, Watford, for *Bricket Fame*, bay gelding, foaled in 1909, bred by Walter Cliff, Melbourne Hall, York; s. Royal Success, d. Wortley Belle 14873 by Sir Horace 5402.
 431 II. (£5.)—THOMAS BLACK, Moorland House, Eldwick, Bingley, Yorks., for *Moorland King*, bay gelding.
 434 III. (£5.)—MRS. F. E. JUDSON, Buenos Aires, for *Melbourne Smoke*, brown gelding, foaled in 1910, bred by Walter Cliff, Melbourne Hall, York; s. Melbourne Dreadnought 11143, d. Miss Bathgate 20104 by Successful 8314.
 435 IV. (£3.)—MRS. A. O. KING, Braithfield Manor, Romsey, Hants, for *Harviestoun Eclat*, chestnut gelding, foaled in 1910, bred by J. E. Kerr, Harviestoun Castle, Dollar; s. Mathias 6473, d. Tinsington Glaze 17003 by Sir Gibbie 1612.
 429 V. (£3.)—JOSHUA BALL, Southworth Hall, Warrington, for *Earl of Southworth 12034*, bay gelding, foaled in 1911; s. Southworth Swell 11219, d. Southworth Merriment 21674 by Southworth Tinsington 9898.
 432 R. N.—J. BLAKELOCK, 58 Cheetham Street, Rochdale, for *Glenavon Alert*.
 H. C.—430.

Class 73.—Harness Mares or Geldings, over 14 and not exceeding 15 hands.

[6 entries.]

- 439 I. (£10, & Champion.)—MRS. J. PUTMAN, Haydon Hill House, Aylesbury, for *Park Carnation 22717*, dark brown mare, foaled in 1907, bred by William Bellamy, Park House, Wimbington, Cambs.; s. Luath 9328, d. Park Sunshine 22733 by Lord Dundreary 7907.
 441 II. (£5.)—PHILIP SMITH, Haddon House, Ashton-on-Mersey, for *Queen of Ayr 20178*, bay mare, foaled in 1903, bred by Mrs. Walker, Lumsfield, West Calder; s. Mathias 6473, d. Dearest 2nd 10827 by Lord Rickell 5288.
 436 III. (£5.)—THOMAS BLACK, Moorland House, Eldwick, Bingley, Yorks., for *Northern Star 23269*, brown mare, foaled in 1912, bred by Alex. Morton, Jun., Gowan Bank, Darvel; s. Mathias 6473, d. Pic-Nic 17640 by Commerce 7406.
 437 IV. (£3.)—W. W. BOURNE, Garston Manor, Watford, for *Bricket Brilliant*, bay gelding, foaled in 1910, bred by Alex. Morton, Gowan Bank, Darvel; s. Mathias 6473, d. by Goldfinder 6th 1791.

Class 74.—Harness Mares or Geldings, over 15 and not exceeding 15.2 hands.

[4 entries.]

- 442 I. (£10.)—JAMES MCG. MCCALL, 4 Whitehall Place, London, S.W., for *Burnhead Lady Champion 21902*, brown mare, foaled in 1909, bred by A. H. Boyle, Banknock, Castlecary; s. Mathias 6473, d. Champion 1937 by Lord Rosebery 1307.
 445 II. (£5.)—PHILIP SMITH, Haddon House, Ashton-on-Mersey, for *King of the Air*, brown gelding, foaled in 1907, bred by Dr. McHill, Littleboro'; s. Mathias 6473, d. Hollin Flashlight 16700 by Norbury Lightning 7563.
 444 III. (£5.)—MRS. J. PUTMAN, Haydon Hill House, Aylesbury, for *Shirley Summer Rose 22811*, bay mare, foaled in 1911, bred by Thomas Smith, Shirley Stud, Hall Green, Birmingham; s. Buckingham Squire 8070, d. Lash Rose of Summer 2990 by Lord Derby 2nd 417.

Class 75.—Harness Mares or Geldings, over 15.2 hands.

[12 entries.]

- 455 I. (£10, & R. N. for Champion.)—PHILIP SMITH, Haddon House, Ashton-on-Mersey, for *Adbolton Black Prince 11314*, black gelding, foaled in 1909, bred by A. W. Hickling, Adbolton, Nottingham; s. Mathias 6473, d. Princess Clare 12327 by Garston Duke of Connaught 3009.
 456 II. (£5.)—MRS. B. TILBURY, Whitechurch House, Preston Road, Brighton, for *Gaythorn*, chestnut gelding, foaled in 1905, bred by James Prentice, Carlisle, Haddington; s. Mathias 6473, d. Sweet Lips 15461 by North Star 1317.
 447 III. (£5.)—MISS A. SYLVIA BROOKBANK, Wing Grange, Oakham, for *Optimistic*, grey gelding, foaled in 1905, bred by H. M. Davey, Macmynan Hall, Afonwen; s. Kassimode 8207.
 454 IV. (£3.)—T. W. STIMPSON, Greenfield Hall, Laleham-on-Thames, for *Prince John*, chestnut gelding, foaled in 1910, bred by George Burton, Thorpe Willoughby, Selby, Yorks.; s. Polonius 4931, d. Lively Lady 8182 by Connaught 1453.

¹ Prizes given by the Manchester Local Committee.

² Gold Challenge Cup given for the best Animal in Classes 72-75.

Award of Live Stock Prizes at Manchester, 1916. lxvii

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

452 V. (£3.)—G. RADFORD, 74 Spotland Road, Rochdale, for *Excelsior*, chestnut gelding, foaled in 1910, bred by R. P. Evans, Woodhatch House, Reigate; s. *Polonius* 4931, d. *Julia* 11929 by *Dagenham* 4214.

453 R. N.—T. W. SIMPSON, for *Romping Bonny*.

Class 76.—Pairs of Harness Mares or Geldings, to be driven in double harness.

[7 entries.]

440 & 441 I. (£10, & *Champion*.¹)—PHILIP SMITH, for *Melbourne Princess* 19347, bay mare, foaled in 1906, bred by Walter Cliff, Melbourne Hall, York; s. *Merry Wildfire* 9342, d. *Melbourne Duchess* 14571 by *Garton Duke of Connaught* 3009; and *Queen of Ayr* (see *Class 73*).

447 & 459 II. (£5, & R. N. for *Champion*.¹)—MISS A. SYLVIA BROCKLEBANK, for *Optimistic* (see *Class 75*); and *Illumination*, bay gelding, foaled in 1906, bred by the Right Hon. Frederick Wrench, Killacoon, Ballybrack, Co. Dublin; s. *Blaze* 2nd 2376, d. *Bay Clara* 14120 by *Chocolate Junior* 4185.

453 & 454 III. (£5.)—T. W. SIMPSON, for *Romping Bonny* 12148, chestnut gelding, foaled in 1911, bred by the late Sir Walter Gilbey, Bt., Eichenham Hall, Essex; s. *Antonius* 10559, d. *Bonny Clara* 6419 by *Connaught* 1453; and *Prince John* (see *Class 75*).

433 & 458 IV. (£3.)—W. W. BOURNE, for *Brickst Fame* (see *Class 72*); and *Bricket Marvel*, bay gelding, foaled in 1914, bred by James B. Wright, York House, Colne, Hunts.; s. *Gentleman John* 3624, d. *Warwick Wren* 17031 by *Fire Boy* 7440.

444 & 460 V. (£3.) MRS. J. PUTMAN, for *Shirley Summer Rose* (see *Class 74*); and *Bygrave Lillian* 21274, bay mare, foaled in 1909, bred by C. Edward E. Cooke, Bygrave, near Baldock, Herts.; s. *Hopwood Viceroy* 9280, d. *Lillian* 8173 by *Lord Denby* 2nd 3092.

446 & 457 R. N.—ROBERT BESWICK, 5 Cromwell Terrace, Scarborough, for *Brilliant* and *Arethusa*.

Class 77.—Pairs of Harness Mares or Geldings, to be driven tandem.

[5 entries.]

447 & 459 I. (£10, & *Champion*.²)—MISS A. SYLVIA BROCKLEBANK, for *Optimistic* (see *Class 75*); and *Illumination* (see *Class 76*).

440 & 441 II. (£5, & R. N. for *Champion*.²)—PHILIP SMITH, for *Melbourne Princess* (see *Class 76*); and *Queen of Ayr* (see *Class 73*).

453 & 454 III. (£5.)—T. W. SIMPSON, for *Romping Bonny* (see *Class 76*); and *Prince John* (see *Class 75*).

Draught Horses in Gears.³

Class 81.—Draught Mares or Geldings, four years old and upwards.⁴

[7 entries.]

88 I. (£5.)—EDWARD DAVIES, The Walk, Partington, near Manchester, for *Caractacus*, black, foaled in 1910, bred by the late Thomas Dare, Poling, Arundel; s. *Poling Hector* 26560, d. *Intake Charm* 39258 by *Harold* 8703.

90 II. (£3.)—PETER DAVIES, Midlands Farm, Warburton, Cheshire, for *Midlands Masterman*, brown, foaled in 1911, bred by William Measures, Hargrave, Huntingdon; s. *Gaer Conqueror* 25218, d. *Hillstone Sunflower* 54146 by *Ercall Wynn* 14620.

465 III. (£2.)—P. WALKER & SON (WARRINGTON & BURTON), LTD., Warrington, for *Cressage*, bay.

463 R. N.—JOHN ORRELL, Rose Bank Farm, Fazakerley, Liverpool C.—464.

Class 82.—Pairs of Draught Mares or Geldings, four years old and upwards.⁴

[4 entries.]

466 I. (£10.)—PETER DAVIES, Midlands Farm, Warburton, Cheshire, for *Midlands Flash* and *Midlands Prince*, bay geldings, foaled in 1914.

Class 83.—Draught Mares or Geldings, four years old and upwards.⁴

[4 entries.]

473 I. (£5), & 471 R. N.—MANCHESTER CORPORATION CLEANSING COMMITTEE, Town Hall, Manchester, for chestnut roan gelding, foaled in 1910.

470 II. (£3.)—MANCHESTER CORPORATION CLEANSING COMMITTEE, for bay gelding, foaled in 1910.

472 III. (£2.)—MANCHESTER CORPORATION CLEANSING COMMITTEE, for dapple grey gelding, foaled in 1911.

¹ Gold Challenge Cup given for the best Pair in *Class 76*.

² The "Manchester" Gold Challenge Cup, given by the Manchester Local Committee for the best Tandem in *Class 77*.

³ Prizes given by the Manchester Local Committee.

⁴ Open only to Owners in Lancashire and Cheshire.

⁵ Open only to Corporations, District Councils, and Railway Companies whose horses are stabled within 20 miles of the Manchester Town Hall.

lxviii *Award of Live Stock Prizes at Manchester, 1916.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]
Class 84.—Pairs of Draught Mares or Geldings, four years old and upwards.¹
 [2 entries.]

- 474 I. (£10).—MANCHESTER CORPORATION CLEANSING COMMITTEE, Town Hall, Manchester, for dark bay gelding, foaled in 1906 and 1907.
 475 II. (£5).—MANCHESTER CORPORATION CLEANSING COMMITTEE, for bay geldings, foaled in 1909 and 1911.

Class 85.—Draught Mares or Geldings, four years old and upwards.²
 [9 entries.]

- 93 I. (£5).—P. WALKER & SON (WARRINGTON & BURTON), LTD., Warrington, for Delight, grey gelding, foaled in 1911, bred by J. H. Finnikin, Onecote, Leek, Staffs.; s. Redlynch Forest King 23628, d. Pethills Flower 61484 by King of the Peak 17430.
 481 II. (£3).—G. NORRIS MIDWOOD & CO., Brown Street, Salford, Manchester, for Prince, roan gelding, foaled in 1911.
 476 III. (£2).—J. & W. BELLHOUSE, LTD., Old Trafford Saw Mills, City Road, Manchester, for Duchess, chestnut mare, foaled in 1911.
 477A R. N.—LLOYD'S PACKING WAREHOUSES, LTD., Castlefield Case Works, Castle Street, Knott Mill, Manchester, for Boxer.
 H. C.—478. O.—480, 481A.

Class 86.—Pairs of Draught Mares or Geldings, four years old and upwards.²
 [6 entries.]

- 485 I. (£10).—P. WALKER & SON (WARRINGTON & BURTON), LTD., Warrington, for Handy and Dreadnought, brown geldings.
 482 II. (£5).—J. & W. BELLHOUSE, LTD., Eagle Wharf Saw Mills, Hulme Hall Lane, Miles Platting, Manchester, for Captain, bright bay gelding, foaled in 1908, and Boxer, bright bay gelding, foaled in 1911.
 484 III. (£3).—IBK DALE PRINTING COMPANY, Smedley Road, Collyhurst, Manchester, for Bonny, roan mare, foaled in 1910, and Captain, roan gelding, foaled in 1910.
 484A R. N.—LLOYD'S PACKING WAREHOUSES, LTD., Castlefield Case Works, Castle Street, Knott Mill, Manchester, for Dobbin and Prince.

Class 87.—Draught Mares or Geldings, four years old and upwards.³
 [8 entries.]

- 488 I. (£5).—O. T. FAULKNER & CO., LTD., 32 Water Street, Manchester, for black gelding.
 487 II. (£3).—J. H. CLAYTON, 26 Lucy Street, Old Trafford, Manchester, for Tommy, black gelding.
 490 III. (£2).—THE GRESHAM CARRYING COMPANY, 55 Dickenson Street, Manchester, for Colonel, bright bay gelding, foaled in 1910.
 493 R. N.—ARTHUR WHYATT, 23 Polygon Avenue, Ardwick, for Boxer.
 H. C.—489, 491. O.—492.

Class 88.—Pairs of Draught Mares or Geldings, four years old and upwards.³
 [5 entries.]

- 495 I. (£10), & 496 II. (£5).—O. T. FAULKNER & CO., LTD., 32 Water Street, Manchester, for bay geldings.
 498 III. (£3).—LLOYD'S PACKING WAREHOUSES, LTD., 60 and 62 Whitworth Street West, Manchester, for Rex, brown gelding, foaled in 1900, and Colonel, brown gelding, foaled in 1910.
 499 R. N.—ARTHUR WHYATT, 23 Polygon Avenue, Ardwick, for Duke and Prince.

Turnouts.⁴

(Including Railway Vans.)

[16 entries.]

Class 89.—Mares or Geldings, four years old and upwards. Vehicle under 7 cwt.

- 500I I. (£5).—GEORGE PIMLOTT, Queen's Buildings, Altrincham, for dark bay.
 500 II. (£3).—THOMAS BARLOW, 8 Broadway, Salford, Manchester, for Longford Swell, bay gelding, foaled in 1908.

¹ Open only to Corporations, District Councils, and Railway Companies whose horses are stabled within 20 miles of the Manchester Town Hall.

² Open only to Brewers, Bleachers, Dyers, and other trades within 20 miles of the Manchester Town Hall.

³ Open only to Team Owners and Carriers within 5 miles of the Manchester Town Hall.

⁴ Open only to owners within 20 miles of Manchester Town Hall. Prizes given by the Manchester Local Committee.

Award of Live Stock Prizes at Manchester, 1916. lxix

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

500J III. (£2).—GEORGE PIMLOTT, for bay.

500E R. N.—ALBERT E. POWNALL, Roseleigh Dairy, 97 Palatine Road, Northenden.
H. C.—500C. C.—500B. 500BA.

Class 90.—*Mares or Geldings, four years old and upwards. Vehicle 7 cwt. or over.*

500G I. (£5).—CHESHIRE LINES RAILWAY, Central Station, Manchester, for Dobbin, bay gelding, foaled in 1911.

500D II. (£3).—GEORGE PIMLOTT, Queen's Buildings, Altrincham, for chestnut foaled in 1912.

500M III. (£2).—DELIVERIES, LTD., Turner Street, Cornbrook, Manchester, for Flower, chestnut mare, foaled in 1910.

500L R. N.—DELIVERIES, LTD., for Blossom.
C.—500K.

Donkey Turnouts.¹

(Trade.)

Class 91.—*Single Donkey Turnout. [25 entries.]*

3 I. (£3).—ROBERT EGBERTON, 53 Carruthers Street, Ancoats, for Paddy, male, fawn.

8 II. (£2).—J. DANIELS, 14 Coulman Street, Rochdale Road, for Dolly, female, dark brown.

12 III. (£1).—HARRY GRIME, 6 Foster Street, Salford, for Billy, male, brown.

7 IV. (15s.).—HARRY FISHER, Trafford Road, Salford, for Maggie, female, brown.

10 V. (10s.).—WILLIAM SWEENEY, 5 Lomas Street, Store Street, for Biddy, female, blue roan.

19 VI. (5s.).—ALFRED GREGORY, 21 Tetlow Street, Beswick, for female, grey.
H. C.—2.

JUMPING COMPETITIONS.²

Class A.—*Special Class. Mares or Geldings. [19 entries.]*

1 I. (£20).—MRS. J. P. GLENCROSS, The Lodge, Battenhall, Worcester, for Nomination.

5 { Equal Prize of £5 5s. } F. W. FOSTER, Marsh Farm, Etwell, Derby, for Comet.

6 { } T. E. WHITTINGHAM, Byrkley Street Stables, Burton-on-Trent, for John B.

11 { } F. VOLLER GRANGE, Alvaston, Nantwich, for Rufus.

16 { } MRS. J. P. GLENCROSS, for Ormond Boy.

Class B.—*Mares or Geldings. [18 entries.]*

14 I. (£20).—MRS. J. P. GLENCROSS, The Lodge, Battenhall, Worcester, for Nomination.

8 { Equal Prize of £7 10s. } F. W. FOSTER, Marsh Farm, Etwell, Derby, for Comet.

11 { } T. & H. WARD, Almsford Bank, Leeds Road, Harrogate, for Fisherman.

12 IV. (£3).—THOMAS GLENCROSS, The Paddocks, Stoke Gifford, near Bristol, for White Hope.

3 V. (£3).—FRANK ALLISON, 1st Royal Dragoons, Cavalry Barracks, York, for Temptress.

Class C.—*Mares or Geldings. [17 entries.]*

4 I. (£15).—THOMAS GLENCROSS, The Paddocks, Stoke Gifford, near Bristol, for White Hope.

9 II. (£10).—F. W. FOSTER, Marsh Farm, Etwell, Derby, for Comet.

13 { Equal Prize of £4. } MRS. J. P. GLENCROSS, The Lodge, Battenhall, Worcester, for Ormond Boy.

15 { } THOMAS GLENCROSS, for Tradesman.

2 V. (£3).—F. VOLLER GRANGE, Alvaston, Nantwich, for Rufus.

Class D.—*Mares or Geldings. [15 entries.]*

3 { Equal Prize of £7 10s. } THOMAS GLENCROSS, The Paddocks, Stoke Gifford, near Bristol, for Blue Baron.

8 { } T. & H. WARD, Almsford Bank, Leeds Road, Harrogate, for Fisherman.

2 III. (£5).—F. VOLLER GRANGE, Alvaston, Nantwich, for Rufus.

1 IV. (£3).—MRS. J. P. GLENCROSS, The Lodge, Battenhall, Worcester, for Ormond Boy.

10 V. (£3).—F. VOLLER GRANGE, for Burgo.

¹ Open only to Owners within 20 miles of Manchester Town Hall. Prizes given by the Manchester Local Committee.

² Prizes given by the Manchester Local Committee.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class E.—Champion Class. Mares or Geldings. [17 entries.]

- 12 I. (£20).—THOMAS GLENCROSS, The Paddocks, Sloke Gifford, near Bristol, for Blue Baron.
 2 { Equal Prize } F. W. FOSTER, Marsh Farm, Etwall, Derby, for Comet.
 11 { of £7 10s. } FRANK ALLISON, 1st Royal Dragoons, Cavalry Barracks, York, for Temptress.
 13 IV. (£3).—F. VOLLER GRANGE, Alvaston, Nantwich, for Rufus.
 10 V. (£3).—MRS. J. P. GLENCROSS, The Lodge, Battenhall, Worcester, for Ormond Boy.

CATTLE.

Shorthorns.¹

Class 92.—Shorthorn Bulls, calved in 1911, 1912, or 1913. [12 entries.]

- 507 I. (£10).—C. W. KELLOCK, Highfields, Audlem, Cheshire, for Jack Tar 115987, white, born Oct. 2, 1912; s. Mariner 102949, d. Olive Parsley 3rd by Alstone Lark 85155.
 508 II. (£5).—WILLIAM T. MALCOLM, Dunmore, Larbert, Stirlingshire, for Royal Marksman 117494, roan, born Feb. 23, 1912, bred by William Anderson, Saphock, Old Meldrum, Aberdeenshire; s. Royal Stamp 110038, d. Meadow Queen 2nd by Diamond Star 91478.
 510 III. (£3).—THE DUKE OF PORTLAND, K.G., Welbeck Abbey, Workson, Notts., for Broadhooks 119216, red, born June 5, 1913; s. Village Diamond 100981, d. Harthill Broadhooks 3rd by Mastodon 102989.
 512 IV. (£2).—E. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for Proud Knight 117117, white, born March 12, 1912, bred by W. M. Scott, Nether Swoll Manor, Stow-on-the-Wold; s. Proud Baron 96572, d. Augusta of Angustus 5th by Lord Marmon 86445.
 505 R. N.—GEORGE HARRISON, Gamford Hall, Darlington, for Collynie Mandarin. C.—502, 503, 506.

Class 93.—Shorthorn Bulls, calved on or between January 1, 1914, and March 31, 1914. [10 entries.]

- 513 I. (£10).—THE RT. HON. A. J. BALFOUR, M.P., Whittingehame, Prentonkirk, for Roving Boy 127852, roan, born Feb. 21, bred by William Duthie, Collynie, Tarves; s. Max of Cluny 11497, d. Rosebud 6th by Diamond King 83204.
 516 II. (£5).—SIR WALPOLE GREENWELL, BT, Marden Park, Woldingham, Surrey, for Marden Ajax 2nd 128747, roan, born March 25; s. Pride of Sittlyton 100005, d. Marden Anemone 3rd by Ascott Constellation 85184.
 514 III. (£3).—R. J. BALSTON, Bilsington Priory, Ashford, Kent, for Bilsington Iron Duke 124337, dark roan, born Jan. 25; s. Star of Dawn 117858, d. Duchess 140th by Tehidy Robin Hood 97420.
 519 R. N.—THE DUKE OF NORTHUMBERLAND, K.G., Alnwick Castle, for Aldsworth Duke. C.—520, 521.

Class 94.—Shorthorn Bulls, calved on or between April 1, 1914, and December 31, 1914. [18 entries.]

- 538 I. (£10, & Champion.²)—J. M. STRICKLAND, Warren House, Brandsby, Easingwold, for Brandsby's Count 6th, roan, born June 24; s. Brandsby's Aristocrat 1th 114422, d. Brandsby's Tulp 3rd (vol. 57, p. 1208) by Prince of Avon 92901.
 526 II. (£5).—W. T. GARNER & SON, Aldsworth, Northleach, Glos., for Aldsworth Diamond 123843, roan, born April 9; s. Village Oak 113620, d. Another Jewel by Bapton Crown 78288.
 530 III. (£3).—F. & G. HUGHES, Greety, Crewe, for Orphan's Bowden's Choice 127200, red and little white, born May 10, bred by James Bonis, Fairlawn, Moy, Ireland; s. Royal Master 117495, d. Orphan Primrose by Golden Dawn 98955.

¹ £120 towards these Prizes were given by the Shorthorn Society of Great Britain and Ireland.

² Champion Prize of £20 given by the Shorthorn Society of Great Britain and Ireland for the best Bull in Classes 92-96. A Silver Medal is given by the Shorthorn Society to the Breeder of the Champion Bull.

Award of Live Stock Prizes at Manchester, 1916. lxxi

- [Unless otherwise stated, each prize animal named below was "bred by exhibitor."]
- 523 IV. (£2.)—R. J. BALSTON, Bilsington Priory, Ashford, Kent, for Bilsington Highflyer 124331, roan, born April 6; s. Golden Cloud 108750, d. Diamond Rosebud by Diamond Ring 91478.
- 535 V. (£2.)—THE DUKE OF PORTLAND, K.G., Welbeck Abbey, Worksop, for Welbeck Choice 128777, red, born June 20; s. Village Diamond 100981, d. Choice Molly by Diamond Choice 94868.
- 533 R. N.—LORD MIDDLETON, Birdsall House, Malton, for Birdsall Commodore. C.—534, 530.

Glass 95.—*Shorthorn Bulls, calved on or between January 1, 1915, and March 31, 1915. [32 entries.]*

- 541 I. (£10, & R. N. for Champion.¹)—HIS MAJESTY THE KING, Royal Farms, Windsor, for Windsor Augustus, light roan, born Jan. 10; s. Proud Warrior 112932, d. Balthayock Augusta 2nd (vol. 59, p. 748) by Ivo of Cluny 89211.
- 564 II. (£5.)—EARL MANVERS, Holme Pierrepont, Nottingham, for Pierrepont Golden Pippin, red, born March 1; s. Pippin 112796, d. Armthwaite Butterfly 37th (vol. 57, p. 686) by Proud Favourite 2nd 100100.
- 542 III. (£3.)—H.R.H. THE PRINCE OF WALES, K.G., Whiteford, Stoke Olmsland, Cornwall, for Butterfly Knight, red, born March 16; s. Collynie Grand Knight 119549, d. Whiterow Butterfly (vol. 60 p. 893) by Sanquhar Dreadnought 113244.
- 547 IV. (£2.)—EDGAR W. BISHOP, Ffield, Oxford, for Hampton's Last, roan, born Feb. 6; s. Hampton Broadhooks 108851, d. Matchless Flame (vol. 58, p. 410) by Bright Flame 104971.
- 557 V. (£2.)—W. T. GARNE & SON, Aldsworth, Northleach, Glos., for Aldsworth Swain, dark roan, born Jan. 6; s. Village Oak 113626, d. Village Belle (vol. 56, p. 698) by Village Beau 87631.
- 543 R. N.—R. J. BALSTON, Bilsington Priory, Ashford, Kent, for Bilsington Vanguard. C.—558, 559, 563, 566, 570.

Glass 96.—*Shorthorn Bulls, calved on or between April 1, 1915, and December 31, 1915. [23 entries.]*

- 593 I. (£10.)—WALTER SPURR, Wexham, Anderby, Alford, Lincs., for Earl of Kingston 2nd, roan, born June 27, bred by Earl Manvers, Holme Pierrepont, Nottingham; s. Earl of Kingston 120041, d. Pierrepont Rainbow (vol. 58, p. 787) by Marquis 109336.
- 577 II. (£5.)—CAPTAIN OLIVE BEHRENS, Swinton Grange, Malton, for Swinton Rosierian, roan, born April 28; s. Swinton Sardonyx 123197, d. Gainsford Rosebud 3rd (vol. 60, p. 811) by Golden Fortune 111922.
- 579 III. (£3.)—W. M. CAZALET, Fairlawne, Tonbridge, for Fairlawne Marquis, dark roan, born May 17; s. Collynie Knight Victor 119550, d. Roan Fragrance (vol. 59, p. 697) by Regent 108754.
- 591 IV. (£2.)—MESSRS. MUNRO, Moness Farm, Aberfeldy, Perthshire, for Gainford Grand Duke 2nd, roan, born April 24, bred by George Harrison, Gainford Hall, Darlington; s. Proud Victor 103447, d. Adbolton Grand Duchess (vol. 58, p. 643) by King Christian of Denmark 86318.
- 588 V. (£2.)—EARL MANVERS, Holme Pierrepont, Nottingham, for Pierrepont Field-Marshal, dark roan, born June 15; s. Royal Sovereign 113193, d. Pierrepont Rosamund (vol. 59, p. 849) by Duke of Kingston 2nd 102088.
- 595 R. N.—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for Edgescote Pirate.
- 586 C. & S. P.² (£10.)—SIR J. H. MADEN, Rockcliffe House, Bacup, for Crews Prospector.
- 582 S. P.² (£5.)—SIR J. H. MADEN, for Rockcliffe Red Earl. C.—573, 578, 585, 589.

Glass 97.—*Group Class, consisting of either three or four Shorthorn Bulls, bred by Exhibitor. [8 entries.]*

- 510, 520, 521, 535 I. (£15.)—THE DUKE OF PORTLAND, K.G., Welbeck Abbey, Worksop, for Broadhooks, Welbeck Christian, Welbeck Squire, and Welbeck Choice.
- 502, 514, 523, 543 II. (£10.)—R. J. BALSTON, Bilsington Priory, Ashford, Kent, for Bilsington Archer, Bilsington Iron Duke, Bilsington Highflyer, and Bilsington Vanguard.
- 538, 539, 569 R. N.—J. M. STRICKLAND, Warren House, Brandsby, Easingwold, for Brandsby's Count 6th, Brandsby's Lord Derwent 25th, and Brandsby's Autocrat.

¹ Champion Prize of £20 given by the Shorthorn Society of Great Britain and Ireland for the best Bull in Classes 92-96. A Silver Medal is given by the Shorthorn Society to the Breeder of the Champion Bull.

² Two Special District Prizes of (£) £10 given by the Shorthorn Society, and (II) £5 given by the Royal Lancashire Agricultural Society, for the two best Bulls in Classes 95 and 96, the property of Exhibitors residing in Lancashire. A Silver Medal is also given by the Shorthorn Society to the breeder of the animal winning the £10 Prize.

lxxii *Award of Live Stock Prizes at Manchester, 1916.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 98.—*Shorthorn Cows (in-milk), calved in or before 1912.* [8 entries.]

- 599 I. (£10, & R. N. for Champion.¹)—W. M. CAZALET, Fairlawne, Tonbridge, for Lady Ramsden 3rd (vol. 59, p. 748), red roan, born May 16, 1912, calved Dec. 29, 1915, bred by R. Wylie Hill, Balthayock, Perth; s. Balthayock Baronet 107758, d. Lady Ramsden by Proud Favourite 84420.
598 II. (£5.)—W. M. CAZALET, for Cairncosh Jilt (vol. 57, p. 757), roan, born Jan. 28, 1907, calved Feb. 11, 1916, bred by Alexander Grassick, Cairncosh, Alford; s. Prince James 89870, d. Jilt 42nd by Courier 85876.
602 III. (£3.)—JOHN H. TOPPIN, Musgrave Hall, Skelton, Penrith, for Bright Jewel (vol. 57, p. 1250), roan, born Feb. 1, 1910, calved Oct. 2, 1915, bred by John C. Toppin; s. Bletchley Lord 90934, d. Bright Lass by British Volunteer 85448.
H. C.—597. O.—601.

Class 99.—*Shorthorn Heifers (in-milk), calved in 1913.* [3 entries.]

- 605 I. (£10, & Champion.¹)—JOHN H. TOPPIN, Musgrave Hall, Skelton, Penrith, for Bright Pearl (vol. 60, p. 1114), white, born Sept. 8, calved Jan. 26, 1916, bred by John C. Toppin & Son; s. Sanguhar Sentinel 110087, d. Bright Jewel by Bletchley Lord 90934.
604 II. (£5.)—W. M. CAZALET, Fairlawne, Tonbridge, for Nonpareil Fairy (vol. 60, p. 596), dark roan, born April 2, calved April 21, 1916, bred by David Anderson, North Lorrston, Aberdeen; s. Mastodon 102899, d. Nonpareil 41st by Golden Fame 76786.
606 III. (£3.)—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for Pierrepont Rosary (vol. 60, p. 928), roan, born Oct. 18, calved June 5, 1916, bred by Earl Manvers, Holme Pierrepont, Nottingham; s. Royal Sovereign 118193, d. Rosalind by Waverley 97640.

Class 100.—*Shorthorn Heifers, calved on or between January 1, 1914, and March 31, 1914.* [6 entries.]

- 612 I. (£10.)—J. DEANE WILLIS, Bapton Manor, Codford, Wilts, for Bramble (vol. 61, p. 1112), red and little white, born Jan. 7; s. Newbliss Augusta's Champion 112637, d. Notlaw Beauty 10th by Broad Arrow 88046.
610 II. (£5.)—LADY GRANTLEY, Red Rice, Andover, for Frost Flower (vol. 61, p. 759), roan, born March 17, bred by Sir James Horlick, Bt., Cowley Manor, Cheltenham; s. Adbolton Prince 97770, d. Frost Duchess by Roving Minstrel 96853.
611 III. (£3.)—THE EARL OF POWIS, Powis Castle, Welshpool, for Powysland Amy 5th (vol. 61, p. 976), roan, born March 3; s. Prince Jubilant 106586, d. Powysland Amy 3rd by Mealsgate Victor 103011.
607 E. N.—THE RT. HON. A. J. BALFOUR, M.P., Whittingehame, Prestonkirk, for Broadhooks Beauty.
O.—609.

Class 101.—*Shorthorn Heifers, calved on or between April 1, 1914, and December 31, 1914.* [12 entries.]

- 618¹ I. (£10.)—SIR WALPOLE GREENWELL, Bt., Marden Park, Woldingham, Surrey, for Marden Malcolm's Princess 5th (vol. 61, p. 784), roan, born April 28; s. Pride of Sittytton 100005, d. Marden Malcolm's Princess 2nd by Ascot Constellation 85184.
613 II. (£5.)—HIS MAJESTY THE KING, Royal Farms, Windsor, for Matilda Gem, roan, born April 29; s. Silver King 117747, d. Matilda 2nd (vol. 56, p. 420) by Golden Treasure 95340.
620 III. (£3.)—WILLIAM J. HOSKEN, Pulnick, Hayle, Cornwall, for Hayle Gwynne 8th (vol. 61, p. 814), white, born April 5; s. Damory Premier 2nd 111487, d. Bartoliver Gwynne 3rd by Jamsary 5th 83779.
623 IV. (£2.)—J. M. STROCKLAND, Warren House, Brandsby, Easingwold, for Brandsby's Jinny 18th (vol. 61, p. 1055), red, born May 20; s. Brandsby's Aristocrat 4th 114422, d. Brandsby's Jinny 15th by Brand-by's Coming Star 107990.
614 E. N.—THE RT. HON. A. J. BALFOUR, M.P., Whittingehame, Prestonkirk, for Bright Jewel.
H. C.—622, 624.

Class 102.—*Shorthorn Heifers, calved on or between January 1, 1915, and March 31, 1915.* [20 entries.]

- 644 I. (£10.)—J. DEANE WILLIS, Bapton Manor, Codford, Wilts, for Lady Dorothy, roan, born Jan. 31; s. Hoar Frost 112077, d. Countess 8th (vol. 55, p. 1256) by Ladys 2nd 79175.
627 II. (£5.)—HIS MAJESTY THE KING, Royal Farms, Windsor, for Windsor Fairy, light roan, born Feb. 5; s. Notlaw Boxer 127158, d. Fairy 84th (vol. 56, p. 499) by Proud Jubilant 106837.

¹ Champion Prize of £20 given by the Shorthorn Society for the best Cow or Heifer in Classes 98-103. A Silver Medal is given by the Shorthorn Society to the Breeder of the Champion Cow or Heifer.

Award of Live Stock Prizes at Manchester, 1916. lxxiii

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 628 III. (£3.)—CAPTAIN OLIVE BEHRENS, Swinton Grange, Malton, for Swinton Lady Weston, roan, born March 1; s. Swinton Simile 117989, d. Lady Sybil (vol. 60, p. 643) *by* Village Graduate 110509.
- 643 IV. (£2.)—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for Lady Pye, roan, born Jan. 20, bred by J. Gill, Staington, Penrith; s. Village Prince 118155, d. Princess May (vol. 58, p. 576) *by* Pride of Abington 103845.
- 638 V. (£2.)—SIR J. H. MADEN, Rockcliffe House, Bacup, for Rockcliffe Seraphina Belle, roan, born March 24; s. Lord Canning 109221, d. Rockcliffe Seraphina 2nd (vol. 59, p. 846) *by* Rockcliffe Remembrancer 108811.
- 632 E. N.—S. F. EDGE, Gallops Homestead, Ditchling, Sussex, for Vahan Victress. C.—630, 636.

Class 103.—Shorthorn Heifers, calved on or between April 1, 1915, and December 31, 1915. [19 entries.]

- 645 I. (£10.)—R. J. BALSTON, Bilsington Priory, Ashford, Kent, for Bilsington Rosemary 5th, roan, born May 2; s. Golden Cloud 108750, d. Rosemary 232nd (vol. 56, p. 902) *by* Lovar Scout 99485.
- 655 II. (£5.)—EARL MANVERS, Holme Pierrepont, Nottingham, for Pierrepont Clarissa, roan, born June 13; s. Royal Sovereign 113193, d. Olaret (vol. 59, p. 885) *by* Morning Star 109463.
- 654 III. (£3.)—SIR J. H. MADEN, Rockcliffe House, Bacup, for Rockcliffe Fragrance, red roan, born April 1; s. Lord Canning 109221, d. Lady Fragrance (vol. 58, p. 585) *by* Regent 106754.
- 651 IV. (£2.)—SIR WALPOLE GREENWELL, BT., Marden Park, Woldingham, Surrey, for Marden Malcolm's Princess 7th, roan, born June 5; s. Pride of Sittytton 100005, d. Marden Malcolm's Princess 2nd (vol. 58, p. 600) *by* Ascott Constellation 85184.
- 660 V. (£2.)—WALTER SPURR, Wexham, Andover, Alford, Lincoln, for Wexham Venus, light roan, born May 18; s. Riby White Count 113041, d. Starlight (vol. 58, p. 399) *by* Cloddy 105053.
- 646 E. N.—G. KELSEY BURGE, Dent-de-Lion, Westgate-on-Sea, for Crews Gold 3rd. C.—659, 661, 663.

Class 104.—Group Class, consisting of either three or four Shorthorn Cows or Heifers, bred by Exhibitor. [4 entries.]

- 603, 612, 644 I. (£15.)—J. DEANE WILLIS, Bapton Manor, Codford, Wilts, for Dauntless Queen, Bramble, and Lady Dorothy.
- 602, 605, 641 II. (£10.)—JOHN H. TOPPIN, Musgrave Hall, Skelton, Penrith, for Bright Jewel, Bright Pearl, and Red Start.
- 625, 626, 627 E. N.—HIS MAJESTY THE KING, for Windsor Bride, Windsor Eliza, and Windsor Fairy.

Dairy Shorthorns.¹

Class 105.—Dairy Shorthorn Bulls, calved in 1914. [10 entries.]

- 666 I. (£10, & Champion.²)—ROBERT W. HOBBES & SONS, Kelmscott, Lechlade, for Kelmscott Acrobat 4th 126217, red, born June 9; s. Kelmscott Juggler 118052, d. Spotless 31st *by* Village Swell 8th 97560.
- 667 II. (£5, & E. N. for Champion.³)—ROBERT L. MOND, Combe Bank, Sevenoaks, for Discoverer 125197, white, born April 2, bred by the late Lord Rothschild, Tring Park, Herts.; s. Conjuror 91310, d. Dolphinlee Rosebud 2nd *by* Bulk Duke 94484.
- 669 III. (£5.)—SAMUEL SANDAY, Puddington Hall, near Chester, for Barrington Viking 121188, white, born April 28; s. Oxford Record 106450, d. Barrington Belle *by* Salmon's Freemason 100526.
- 664 E. N.—THE EARL OF DERBY, K.G., Knowsley, Prescot, Lancs., for Preshute Dolphin.
- 666, 721, 740 (Cup.⁴)—ROBERT W. HOBBES & SONS, for Kelmscott Acrobat 4th, Limhill 2nd, and Marjory 14th. C.—665.

Class 106.—Dairy Shorthorn Bulls, calved in 1915. [13 entries.]

- 682 I. (£10.)—SAMUEL SANDAY, Puddington Hall, near Chester, for Master Butterfly, white, born April 18; s. Barrington Snowstorm 110940, d. Lady Butterfly 3rd (vol. 58, p. 910) *by* Dallam Principal 111482.
- 678 II. (£5.)—ROBERT W. HOBBES & SONS, Kelmscott, Lechlade, Glos., for Kelmscott Juggler 38th, red and little white, born March 13; s. Trickster 4th 118053, d. Hawthorn 9th (vol. 58, p. 754) *by* Royal Hampton 11th 96908.

¹ £22 towards these Prizes were given by the Dairy Shorthorn Association and £20 by the Shorthorn Society.

² Champion Prize of £10 given by the Dairy Shorthorn Association, for the best Bull in Classes 105 and 106.

³ Challenge Cup given through the Dairy Shorthorn Association for the best Group of one Bull and two Cows or Heifers in Classes 105-109. Two at least of the animals must have been bred by exhibitor.

lxxiv Award of Live Stock Prizes at Manchester, 1916.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 679 III. (£3.)—LORD LUCAS, Wreast Park, Ampthill, for Premier Gift, red roan, born May 30; s. Heirloom 120692, d. Primrose Gift (vol. 58 p. 745) by Good Gift 91889.
 683 IV. (£2.)—J. L. SHIRLEY, Silverton, Bletchley, for Kelmescott Juggler 38th, red, born Jan. 18, bred by Robert W. Hobbs & Sons, Kelmescott, Lechlade, Glou.; s. Trickster 4th 118058, d. Daisy 25th (vol. 56, p. 783) by Cranford (general 105148).
 676 R. N.—JOHN CHIVERS, Histon, Camb., for Vanguard.
 679, 700, 701 (R. N. for Cup.)—LORD LUCAS, for Premier Gift, Primrose Gift, and Wreast Planet 2nd.
 H. O.—686. C.—675, 677.

Class 107.—Dairy Shorthorn Cows (in-milk), calved in or before 1911.

[33 entries.]

- 700 I. (£10, & Champion.)—LORD LUCAS, Wreast Park, Ampthill, for Primrose Gift (vol. 58, p. 745), roan, born March 29, 1908, calved June 20, 1916, bred by John Graves, Thornby Villa, Wigton; s. Good Gift 91889, d. British Primrose by British Knight 76249.
 689 II. (£5.)—(J. KELSEY BURGE, Dent-de-Lion, Westgate-on-Sea, for Lady Thrush 3rd (vol. 57, p. 1243) white, born May 20, 1907, calved Feb. 28, 1916, bred by the Rev. George Moore, Cowley Vicarage, Oxford; s. Baxter's Fancy 82833, d. Lady Thrush by Pretender 79592.
 706 III. (£3.)—GEORGE B. NELSON & SONS, Cockerham Hall, Garstang, for Proud Strawberry (vol. 56, p. 787), red, born July 20, 1908, calved June 25, 1916, bred by T. H. Hodgson, Nalhouse Millom; s. Royal Benedict 100404, d. Mellow Strawberry by Bandman 85222.
 703 IV. (£2.)—ROBERT L. MOND, Combe Bank, Sevenoaks, for Johnby Rose 10th (vol. 57, p. 1308), roan, born Dec. 12, 1907, calved May 14, 1916, bred by J. & T. H. Workman, Orchard House, Carleton, Carlisle; s. Bouncing Boy 94395, d. Johnby Rose 9th by Major King 88213.
 708 V. (£2.)—HERBERT H. OWTREAM, Newland Hall, near Lancaster, for Wallflower 8th (vol. 57, p. 862), roan, born Aug. 2, 1908, calved June 15, 1916, bred by J. R. Dover, Woodfoot, Shap, Westmorland; s. Duke of Lancaster 91558, d. Wallflower 8th by Osar King 80822.
 719 R. N.—CAPT. HENRY FITZHERBERT WRIGHT, M.P., Yeldersley Hall, Ashbourne, for Darlington Cranford 68th.
 H. O.—714. C.—701, 717.

Class 108.—Dairy Shorthorn Cows (in-milk), calved in 1912. [17 entries.]

- 722 I. (£10, & R. N. for Champion.)—LORD LUCAS, Wreast Park, Ampthill, for Primrose Dairymaid (vol. 59, p. 889), red roan, born Jan. 25, calved May 31, 1916, bred by J. Moffat, Watercrock, Kendal; s. Dairyman Mere 106328, d. Primrose Gift by Good Gift 91889.
 724 II. (£5.)—ROBERT L. MOND, Combe Bank, near Sevenoaks, for Coral Belle (vol. 59, p. 695), roan, born March 5, calved June 7, 1916, bred by George Gerrard, Offerton Farm, Hindlip, Worcs.; s. Merry Lorn 103048, d. Coral Wreath 2nd by Northern Star 92600.
 721 III. (£3.)—ROBERT W. HOBBS & SONS, Kelmescott, Lechlade, for Lemhill 32nd (vol. 59, p. 757), red and little white, born Nov. 4, calved June 18, 1916; s. Cranford Freeman 114883, d. Zenith 20th by Village Swell 8th 97560.
 733 IV. (£2.)—THE DUKE OF WESTMINSTER, Eaton, Chester, for Rosamund Rose, red and white, born March 30, calved May 15, 1916, bred by P. Bird, Fern Bank, Windle Hill, Neston; s. Royal Voucher 103709, d. Rosamund 3rd by Silver King 84781.
 736 R. N.—CAPT. A. S. WILLS, Thornby Hall, Northampton, for Victoria 2nd.
 H. O.—720. C.—735.

Class 109.—Dairy Shorthorn Heifers (in-milk), calved in or after 1913. [17 entries.]

- 740 I. (£10.)—ROBERT W. HOBBS & SONS, Kelmescott, Lechlade, for Marjory 14th (vol. 60, p. 875), red, born Oct. 22, 1913, calved May 25, 1916; s. Trickster 4th 118058, d. Marjory 10th by Kelmescottian 28th 95598.
 752 II. (£5.)—THE DUKE OF WESTMINSTER, Eaton, Chester, for Lily Gift (vol. 61, p. 816), light roan, born March 14, 1914, calved May 23, 1916, bred by F. Bird, Fern Park, Windle Hill, Neston, Cheshire; s. Diamond Gift 125181, d. Lily Charter by Royal Charter 89910.

¹ Challenge Cup given through the Dairy Shorthorn Association for the best Group of one Bull and two Cows or Heifers in Classes 105-109. Two at least of the animals must have been bred by exhibitor.

² Champion Prize of £10 given by the Dairy Shorthorn Association, for the best Cow or Heifer in Classes 107-109.

Award of Live Stock Prizes at Manchester, 1916. lxxv

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 743 IIL. (£3.)—ROBERT L. MOND, Combe Bank, near Sevenoaks, for Somerford Barrington 2nd (vol. 61, p. 615), roan, born March 15, 1914, calved May 14, 1916, bred by G. Bickford, Somerford, Brewood; s. Cleve Baronet 114731, d. Bentley Barrington by H. R. H. 99150.
- 737 IV. (£2.)—C. R. W. ADEANE, Babraham Hall, Cambridge, for Babraham Bloom (vol. 60, p. 589), roan, born March 30, 1913, calved May 21, 1916; s. Babraham Monitor 110837, d. Bloom by Woolmers Joy 101170.
- 753 R. N.—THE DUKE OF WESTMINSTER, for Moppy Gem's Jewel.
H. C.—705. C.—738, 761.

Shorthorn Dairy Cattle.¹

Class 110.—*Dairy Cows (in-milk)*. [8 entries.]

- 757 I. (£10.)—GEORGE B. NELSON & SONS, Cockerham Hall, near Garstang, for Milkmaid, roan, born about 1910, calved June 25, 1916.
- 761 II. (£5.)—J. W. WHITOME, Eastmoor, Doddington, Cambs., for red, calved May 24, 1916, bred by F. O. Webb, Doddington, Cambs.

Class 111.—*Pairs of Dairy Cows (in-milk)*. [2 entries.]

- 763 I. (£15.)—WALTER WILSON, Kildside Farm, Milnthorpe, for Daisy, calved June 19, 1916, and Dolly, calved June 16, 1916.

Class 112.—*Dairy Cows (in-calf)*. [11 entries.]

- 767 I. (£10.)—RICHARD HALL, Torrisholme Hall, Morecambe, for Morecambe Pippin, roan.
- 774 II. (£5.)—THOMAS WARBURTON, Daresbury, near Warrington, for Lady, roan.
- 769 III. (£3.)—HORRIDGE & CORNALL, Bolholt Printworks, Bury, for roan.
- 765 R. N.—GODFREY FITZHUGH, Plas Power, Wrexham.

Class 113.—*Pairs of Dairy Cows (in-calf)*. [6 entries.]

- 776 I. (£15.)—RICHARD HALL, Torrisholme Hall, Morecambe, for Morecambe Sunbeam, red and little white, and Morecambe Blossom, roan.
- 778 II. (£10.)—HORRIDGE & CORNALL, Bolholt Printworks, Bury, for roans.

Lincolnshire Red Shorthorns.²

Class 114.—*Lincolnshire Red Shorthorn Bulls, calved in 1910, 1911, 1912, or 1913*. [2 entries.]

- 782 I. (£10, & Champion.)³—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for Somercotes Polar Star 9328, born Nov. 1, 1911, bred by T. H. B. Freshney, South Somercotes, Louth; s. Rising Star 7839, d. by Salfleet Bonus 3582.
- 781 II. (£5.)—ROBINSON & SON, Anderby, Alford, Lincs., for Croxton Ruby 33rd 8939, born Sept. 22, 1911, bred by Frank Bourne, Croxton House, Brocklesby; s. Scampton King of the Rubies 7122, d. Wootton Dairymaid 2nd by Neptune 2nd 4927.

Class 115.—*Lincolnshire Red Shorthorn Bulls, calved in 1914*. [3 entries.]

- 783 I. (£10.)—BENJAMIN SIMONS, The Grange, Willoughby, Alford, Lincs., for The Tetrarch 11082, born Jan. 31, bred by L. W. & H. Gibson, Digby, Lincoln; s. Birthorpe Beau 8135, d. Cowbit Excel by Willoughby Athlete 5745.
- 785 II. (£5.)—J. G. WILLIAMS, Pendley Manor, Tring, for Scampton Paragon 10991, born April 23, bred by G. E. Sanders, Scampton, Lincoln; s. Anderby Pilot 5793, d. by Brandon Grenadier 4274.
- 784 III. (£3.)—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for Bletchingley Gorgias 10490, born July 8, bred by A. P. Brandt, Bletchingley Castle, Surrey; s. Crimson Crescent 8240, d. Kirton Britannia by Scampton Goldmine 4567.

Class 116.—*Lincolnshire Red Shorthorn Bulls, calved in 1915*. [8 entries.]

- 792 I. (£10, & R. N. for Champion.)³—J. G. WILLIAMS, Pendley Manor, Tring, for Pendley Morning Star, born Jan. 7; s. Croxton Ruby 33rd 8939, d. Pendley Starlight (vol. 15, p. 352) by Keddington Baron 4881.
- 790 II. (£5.)—MRS. WEBB & SONS, Melton Ross, Barnethy, Lincs., for Kirmington Ruby King 21st 11705, born April 6, bred by George Marria, Kirmington, Brocklesby, Lincs.; s. Scampton King of the Rubies 7122, d. Normanby Felicia by Stenigot Soldier 2655.

¹ Prizes given by the Manchester Local Committee.

² £80 towards these Prizes were given by the Lincolnshire Red Shorthorn Association.

³ Champion Prize of £10 given by the Lincolnshire Red Shorthorn Association for the best Bull in Classes 114-116.

lxxvi *Award of Live Stock Prizes at Manchester, 1916.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 791 **III.** (£3.)—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for *Stenigot Knight* 1885, born Jan. 6, bred by R. Chatterton, Welbourn Hall, Lincoln; s. Nonsuch Comet 7769, d. *Stenigot Violet* 20th by *Stenigot Oornish Knight* (101059).
 793 **R. N.**—J. G. WILLIAMS, for *Pendley Sappy Lad*.
H. C.—786.

Class 117.—*Lincolnshire Red Shorthorn Cows (in-milk), calved in or before 1912.*
 [7 entries.]

- 800 **I.** (£10, & *Champion*.)—J. G. WILLIAMS, *Pendley Manor, Tring*, for *Pendley Rose* (vol. 19, p. 331), born Feb. 24, 1912, calved June 9, 1916, bred by W. B. Swallow, Wootton Lawn, Uxbridge; s. *Scampton Luxury* 7884, d. *Horkstow Lalae* by *Bumper* 2nd 1793.
 798 **II.** (£5.)—J. G. WILLIAMS, for *Bletchingley Aurora* (vol. 18, p. 268), born June 10, 1908, calved Jan. 17, 1916, bred by A. P. Brandt, Bletchingley Castle, Surrey; s. *Moreton Premier* 5522, d. *Surfleet Dorothy* by *Scampton Blood Sucker* 8043.
 796 **III.** (£3.)—NEWTON, CHAMBERS & CO., LTD., *Thorncliffe Iron Works*, near *Sheffield*, for *Cockerington Cowslip*, born in Feb., 1911, calved June 6, 1916, bred by J. W. Weedham, *South Cockerington*, near *Louth*; s. *Saltfleet Wainfleet* 7108, d. by *Saltfleet Bonus* 3582.
 799 **R. N.**—J. G. WILLIAMS, for *Kedlington Carratt 3rd*.
H. C.—797.

Class 118.—*Lincolnshire Red Shorthorn Cows or Heifers (in-milk), calved in or before 1913, showing the best milking properties.* [7 entries.]

- 805 **I.** (£10.)—JOHN EVENS, *Burton, Lincoln*, for *Burton Fillpail 2nd* (vol. 18, p. 269), born Feb. 23, 1909, calved May 13, 1916; s. *Mr. Profit* 4926, d. *Fillpail* by *Cromwell* 2nd 2477.
 806 **II.** (£5.)—JOHN EVENS, for *Sherwood No. 24* (vol. 20, p. 384), born June, 1909, calved June 6, 1916, bred by F. B. Wilkinson, *Cavendish Lodge, Edwinstowe, Newark*; s. *Queen's Birthday* 4511, d. by *Kirby Abbott* 2942.
 804 **III.** (£3.)—JOHN EVENS, for *Burton Cowslip 6th* (vol. 19, p. 314), born March 21, 1910, calved May 22, 1916; s. *Mr. Profit* 4926, d. *Burton Cowslip 5th* by *Burton Rex* 2131.
 803 **R. N.**—STANLEY BLUNDELL, *Bendish House, Welwyn, Herts.*, for *Bendish Dorothy*.
H. C.—802.

Class 119.—*Lincolnshire Red Shorthorn Heifers (in-milk), calved in 1913.*
 [4 entries.]

- 810 **I.** (£10, & *R. N.* for *Champion*.)—J. G. WILLIAMS, *Pendley Manor, Tring*, for *Pendley Royal Ruby* (vol. 22), born April 8, calved April 23, 1916, bred by T. H. B. Froehney, *Granthorpe, Lincs.*; s. *Saltfleet Ruby Champion* 8509, d. by *Saltfleet Imperialist* 4549.
 811 **II.** (£5.)—J. G. WILLIAMS, for *Pendley Ruby 2nd* (vol. 21, p. 362), born July 22, calved Jan. 3, 1916; s. *Saltfleet Ruby Champion* 8509, d. *Saltfleet Ruby 20th* by *Blucher of Wick* (94361).
 808 **III.** (£3.)—E. M. & S. M. GRANTHAM, *The Rookery, West Keal, Spilsby*, for *Keal Unity* (vol. 21, p. 317), born April 12, calved Jan. 10, 1916, bred by *Capt. E. M. Grantham, West Keal, Spilsby*; s. *Keal Rascal* 8360, d. *Keal Becky* by *Cornhaloom* 1831.
 809 **R. N.**—NEWTON, CHAMBERS & CO., LTD., *Thorncliffe Iron Works, near Sheffield*, for *Lackham Pearly 3rd*.

Class 120.—*Lincolnshire Red Shorthorn Heifers, calved in 1911.*
 [6 entries.]

- 816 **I.** (£10.)—J. G. WILLIAMS, *Pendley Manor, Tring*, for *Bletchingley Galatea* (vol. 21, p. 265), born March 26, bred by A. P. Brandt, *Bletchingley Castle, Surrey*; s. *Crimson Crescent* 8240, d. *Kirton Venus* by *Partney Monarch* 2nd 5093.
 817 **II.** (£5.)—J. G. WILLIAMS, for *Pendley Ruby 3rd*, born Oct. 17; s. *Croxton Ruby* 33rd 8939, d. *Saltfleet Ruby 20th* (vol. 18, p. 345) by *Blucher of Wick* (94361).
 815 **III.** (£3.)—F. B. WILKINSON, *Cavendish Lodge, Edwinstowe, Newark*, for *Sherwood Maiden*, born Jan. 24; s. *Scampton King of the Valley* 7123, d. *Sherwood No. 8* (vol. 20, p. 383) by *Dunsby Red 3rd* 4017.
 813 **R. N.**—E. M. & S. M. GRANTHAM, *The Rookery, West Keal, Spilsby*, for *Keal Hilda 4th*.
H. C.—812. **C.**—814.

Class 121.—*Lincolnshire Red Shorthorn Heifers, calved in 1915.*
 [5 entries.]

- 821 **I.** (£10.)—J. G. WILLIAMS, *Pendley Manor, Tring*, for *Pendley Duchess 5th*, born Jan. 8; s. *Croxton Ruby* 33rd 8939, d. *Grimblethorpe Duchess* 2nd (vol. 19, p. 380) by *Scampton Angler* 2327.

¹ *Champion Prize of £10 given by the Lincolnshire Red Shorthorn Association for the best Cow or Heifer in Classes 117-121.*

Award of Live Stock Prizes at Manchester, 1916. lxxvii

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 818 **II. (£5).**—**VICE-ADMIRAL SIR DAVID BEATTY**, Brooksby Hall, Leicester, for Brooksby Princess, born Jan. 13; s. Scampton Majestic 8513, d. Brooksby Why Not (vol. 17, p. 278) by Grange Prince 4843.
 820 **III. (£3).**—**F. B. WILKINSON**, Cavendish Lodge, Edwinstowe, Newark, for Sherwood Lady 2nd, born Jan. 20; s. Somercotes Polar Star 9328, d. Sherwood No. 26 (vol. 20, p. 384) by Dunsby Red 3rd 6017.
 819 **R. N.**—**VICE-ADMIRAL SIR DAVID BEATTY**, for Brooksby Wanton 4th.

Herefords.¹

Class 122.—Hereford Bulls, calved in 1911, 1912, or 1913. [4 entries.]

- 826 **I. (£10, & Champion.*)**—**T. L. WALKER**, Ankerdine, Knightwick, Worcester, for Sentry 29380, born Jan. 19, 1911, bred by P. W. Taylor, Birchend, Ledbury; s. Marathon 27000, d. Regret by Volunteer 21857.
 823 **II. (£5).**—**GEORGE BUTTERS**, Hill House, Newton, Leominster, for Newton Albion 30810, born Jan. 4, 1913; s. Baronet 28875, d. Gaylass 2nd by Sailor Prince 26485.
 825 **III. (£5).**—**THE EARL OF COVENTRY**, Croome Court, Worcester, for Dollar 30497, born Feb. 6, 1913; s. Ivington Bright 28380, d. Dolly by Earl Marshal 22106.
 824 **R. N.**—**HUGH A. CHRISTY**, Llangoed Castle, Llyswen, for Sailor.

Class 123.—Hereford Bulls, calved in 1914. [7 entries.]

- 828 **I. (£10).**—**W. H. DONNE DAVIES**, Pigeon House, Weston Baggard, Hereford, for Merry Monarch 31748, born Jan. 27, bred by P. W. Taylor, Birchend, Ledbury; s. Royal Sovereign 30050, d. Suffragette by Marathon 27000.
 831 **II. (£5).**—**KENNETH W. MILNES**, Stanway Manor, Church Stretton, for Gimcrack 31519, born May 15; s. British Oyster 28950, d. Lady Brenda by Commandant 22040.
 833 **III. (£3).**—**MAJOR STEWART ROBINSON**, Lynhales, Kingston, Herefordshire, for Ringer 31920, born March 18, bred by William Griffiths, Aldersend, Tarrington, Hereford; s. Starlight 28754, d. Ringlet by Change Ringer 22478.
 827 **R. N.**—**HUGH A. CHRISTY**, Llangoed Castle, Llyswen, for Llangoed Charley.
H. C.—832.

Class 124.—Hereford Bulls, calved in January or February, 1915.

[17 entries.]

- 834 **I. (£10).**—**FRANK BIBBY**, Hardwicke Grange, Shrewsbury, for Olive Hopeful 3rd, born Jan. 4; s. Crusader 26038, d. Olive Spangle 2nd (vol. 45, p. 323) by Othello 24182.
 830 **II. (£5).**—**SIR J. R. G. COTTELL, BT.**, Garnons, Hereford, for Red Gauntlet, born Jan. 2; s. Purple King 29294, d. Stella (vol. 45, p. 418) by Marcellus 22353.
 843 **III. (£3).**—**CAPT. E. L. A. HEYGATE**, Buckland, Leominster, for Admiral 32169, born Jan. 11; s. Western Director 31169, d. Mermaid 7th (vol. 45, p. 409) by Waverley 25862.
 836 **IV. (£2).**—**GEORGE BUTTERS**, Hill House, Newton, Leominster, for Newton Realm, born Jan. 22; s. Newstead 30814, d. Myrtle 3rd (vol. 45, p. 369) by Sailor Prince 26485.
 837 **V. (£2).**—**E. T. CAVE**, Kimbolton, Leominster, for Bounds Formidable, born Feb. 4, bred by H. Weston & Sons, The Bounds, Much Marcle, Herefordshire; s. Buckland Captain 28708, d. Accomplish 4th (vol. 46, p. 1030) by Sovereign Remedy 27234.
 849 **R. N.**—**CHARLES T. PULLEY**, Lower Eaton, Hereford, for Eaton Banner.
H. C.—844. **C.**—843.

Class 125.—Hereford Bulls, calved in 1915, on or after March 1.

[13 entries.]

- 861 **I. (£10, & R. N. for Champion.*)**—**MRS. ELLEN MEDLICOTT**, Court Farm, Bodenham, Herefordshire, for Bodenham Foreman, born March 16; s. Fearless Fortune, d. Blossom 2nd (vol. 46, p. 554) by Lancer 21515.
 852 **II. (£5).**—**FRANK D. BAUGH**, Onibury, Shropshire, for Oney Chancellor, born April 16; s. Hampton Surprise 30630, d. Oney Coral (vol. 44, p. 236) by Albert 25896.
 859 **III. (£3).**—**ALLEN E. HUGHES**, Wintercote, Leominster, for Leekington, born March 3; s. Sheepsote King 31024, d. Lavinia (vol. 46, p. 632) by Lucus 27673.
 851 **IV. (£2).**—**HIS MAJESTY THE KING**, Royal Farms, Windsor, for Paymaster, born March 26; s. Royal Treasure 30997, d. Puella (vol. 46, p. 295) by Brigadier 21939.
 860 **R. N.**—**RICHARD B. MARSH**, Holloway, Craven Arms, for Holloway Jim.
H. C.—854. **C.**—853, 862.

Class 126.—Hereford Cows (in-milk), calved in or before 1912. [5 entries.]

- 868 **I. (£10, & Champion.*)**—**THE EARL OF COVENTRY**, Croome Court, Worcester, for Madrigal (vol. 42, p. 384), born March 10, 1907, calved Jan. 11, 1916; s. Maxwell 24155, d. Madcap by Home Office 20073.

¹ £50 towards these Prizes were given by the Hereford Herd Book Society.

² Champion Prize of £10 10s. given by the Hereford Herd Book Society for the best Bull in Classes 122-125.

³ Champion Prize of £10 10s. given by the Hereford Herd Book Society for the best Cow or Heifer in Classes 126-129.

lxxviii Award of Live Stock Prizes at Manchester, 1916.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

867 II. (£5.)—SIR J. R. G. COTTERELL, BT, Garnons, Hereford, for Mistletoe (vol. 10, p. 417), born April 18, 1906, calved Jan. 9, 1916; s. Marcellus 22853, d. Merriment by Toronto 18751.

864 III. (£3.)—HIS MAJESTY THE KING, Royal Farms, Windsor, for Radiance (vol. 46, p. 298), born Jan. 7, 1912, calved March 16, 1916; s. Broadward Gambler 26694 d. Rhododendron by Gilderoy 20653.

Class 127.—*Hereford Heifers (in-milk), calved in 1913.* [2 entries.]

870 I. (£10.)—THE EXORS. OF THE LATE J. L. HALL, Lulham, Madley, Herefordshire, for Miss Gordon (vol. 45, p. 894), born Jan. 20, calved April 19, 1916, bred by R. O. Rees, Braddws, Three Cocks; s. Gamecock 26145, d. Countess by Royal Bage 25738.

869 II. (£5.)—THE EARL OF COVENTRY, Croome Court, Worcester, for Milestone (vol. 45, p. 428), born Feb. 7, calved Jan. 28, 1916; s. Dollymount 27500, d. Millic by Golden Plume 24633.

Class 128.—*Hereford Heifers, calved in 1914.* [4 entries.]

871 I. (£10, & R. N. for Champion.)—FRANK BIBBY, Hardwicke Grange, Shrewsbury, for Olive Lady 6th (vol. 48, p. 328), born Jan 5, s. Crusader 26038, d. Proud Lady by Proud Lad 20941.

873 II. (£5.)—KENNETH W. MILNES, Stanway Manor, Church Stretton, for Stanway Jessamine (vol. 46, p. 741), born Jan. 19; s. Coupe d'Or 29016, d. Jersey by Lord Lieutenant 22328.

872 III. (£3.)—F. FITCH MASON, The Farnam, Killay, Gilmorgan, for Farnam Ladyship (vol. 46, p. 723), born Jan. 30; s. Bonny Bert 28910, d. Lady Love by Sultan 19780.

Class 129.—*Hereford Heifers, calved in 1915.* [9 entries.]

875 I. (£10.)—FRANK BIBBY, Hardwicke Grange, Shrewsbury, for Olive Prospera, born March 2; s. Farnam Master 30548, d. Downton Ladylike (vol. 43, p. 199) by Royal Rupert 20976.

883 II. (£5.)—LORD RHONDDA, Llanwern Park, Newport, Mon., for Saucy Sally, born Jan 10; s. Father Christmas 28689, d. Salty Sally (vol. 46, p. 978) by Perfection 22450.

879 III. (£3.)—ALLEN E. HUGHES, Wintercott, Leominster, for Privit, born Jan. 26; s. Sheepcote King 31022, d. Popsy (vol. 46, p. 634) by Lucus 27673.

882 R. N.—KENNETH W. MILNES, Stanway Manor, Church Stretton, for Stanway Gem 3rd.
H. C.—880. C.—877.

Devons.²

Class 130.—*Devon Bulls, calved in 1911, 1912, 1913 or 1914.* [3 entries.]

884 I. (£10, & Champion.)—HIS MAJESTY THE KING, Royal Farms, Windsor, for Windsor Captain 8325, born Feb. 28, 1913; s. Capton Master 6689, d. Highfield Famous 3rd 22839 by Highfield Royal 6829.

886 II. (£5, & R. N. for Champion.)—CHARLES MORRIS, Highfield Hall, St. Albans, for Highfield Reminder 8539, born Jan. 17, 1914; s. Holcombe Reminder 7413, d. Highfield Farthing 2nd 22890 by Pound Bollinger 5817.

885 III. (£3.)—CHARLES MORRIS, for Highfield Goldfinder 2nd 8528, born Jan. 23, 1914; s. Holcombe Reminder 7413, d. Goldencup 23148 by Capton Harold 4728.

Class 131.—*Devon Bulls, calved in 1915.* [3 entries.]

888 I. (£10.)—CHARLES MORRIS, Highfield Hall, St. Albans, for Highfield Gem, born Feb. 20; s. Rockwell Gem 8252, d. Handsome 2nd 26175 by Capton Beano 6285.

887 II. (£5.)—CHARLES MORRIS, for Highfield Chieftain, born Jan. 28; s. Highfield Victor 7146, d. Primrose 4th C 175 by Butcher Bird 5984.

889 III. (£3.)—CHARLES MORRIS, for Highfield Marksman, born Jan. 23; s. Holcombe Reminder 7413, d. Highfield China Cup 4th 25237 by Pound Lord Brassy 5th 5622.

Class 132.—*Devon Cows or Heifers (in-milk), calved in or before 1913.*

[5 entries.]

894 I. (£10, & Champion.)—CHARLES MORRIS, Highfield Hall, St. Albans, for Western Goodmaid 26098, born May 11, 1911, calved April 18, 1916, bred by William Tuckett, Stockleigh Pomeroy, Crediton; s. Cronje 5470, d. Goodmaid 21763 by Capton Harold 4728.

893 II. (£5, & R. N. for Champion.)—CHARLES MORRIS, for Highfield Charmer 26055, born April 10, 1912, calved May 2, 1916; s. Holcombe Rufus 7149, d. Whimble Beauty 3rd 19670 by Hestercombe Redlight 4417.

¹ Champion Prize of £10 10s. given by the Hereford Herd Book Society for the best Cow or Heifer in Classes 126-128.

² £40 towards these Prizes were given by the Devon Cattle Breeders' Society.

³ Champion Prize of £10 10s. given by the Devon Cattle Breeders' Society for the best Bull in Classes 130 and 131, entered or eligible for entry in the Devon Herd Book.

⁴ Champion Prize of £10 10s. given by the Devon Cattle Breeders' Society for the best Cow or Heifer in Classes 132-135, entered or eligible for entry in the Devon Herd Book.

Award of Live Stock Prizes at Manchester, 1916. lxxix

[Unless otherwise stated, each prize animal named below was "bred by exhibitor"]

891 III. (£3.)—HIS MAJESTY THE KING, Royal Farms, Windsor, for Fancy 24825, born Feb. 10, 1911, calved May 6, 1916, s. Capton Ploughboy 4923, d. Fairy 17538 by Councilor 5407

892 R. N.—LORAM BROTHERS, Aylesbeare, near Exeter, for Rousdon Aliae.

Class 133.—Devon Dairy Cows or Heifers (in-milk) calved in or before 1913.

[8 entries.]

895 I. (£10.)—JOHN H. CHIOK, Wynford Eagle, Dorchester, for Compton Quality 2nd C 119, born Jan. 29, 1907, calved April 14, 1916, bred by William D. Chick Compton Valence Dorchester, s. Compton Gent 6010, d. Compton Quality B 102 by Butterleigh 8998.

896 II. (£5.)—JOHN H. CHIOK, for Wynford-Wynford A 113, born in 1905, calved April 1, 1916.

898 III. (£3.)—R. A. CLARKE, Manor Farm, Chiselborough, Stoke-on-Ham for Mand Royal 24955, born May 27, 1911, calved May 14, 1916; s. Woodlands Milkman 6592, d. Mand C 90 by Morning Star 4639

901 R. N.—LORAM BROTHERS, Aylesbeare, near Exeter, for Gentle 1st.

Class 134.—Devon Heifers, calved in 1914. [1 entry.]

903 I. (£10.)—CHARLES MORRIS, Highfield Hall, St. Albans, for Highfield Charity 3rd 27751, born Jan. 26, s. Holcombe Reminder 7413, d. Highfield Charity 2nd 25236 by Pound Lord Brassy 5th 5822.

Class 135.—Devon Heifers, calved in 1915 [3 entries]

906 I. (£10.)—CHARLES MORRIS, Highfield Hall, St. Albans, for Highfield Blossom 2nd, born May 13; s. Highfield Victor 7146, d. May Blossom 6th 24268 by Stockley Handy Boy 6914.

904 II. (£5.)—HIS MAJESTY THE KING, Royal Farms, Windsor, for Windsor Dorothy, born March 28, s. Durston Pilot 6099, d. Fennington Dorothy 24394 by Dewdrop Boy 9th 6038.

905 III. (£3.)—GEORGE GLANFIELD, West Lake, Okehampton, for Elegance, born Feb. 1, bred by Major C. H. Calmady-Hamlyn, Leawood, Bridestowe; s. Brindgood 24730, d. Bowden Elegance 23745 by Compton Topper 5466.

South Devons.¹

Class 136.—South Devon Bulls, calved in or before 1914. [4 entries.]

908 I. (£10. & Champion.²)—ANDREW ROGERS, Great Woodford, Plympton, for Brownstone Laddie 4774, born Jan. 1, 1913; s. Pastime 3837, d. Fimpernel 6364 by Marmaduke 1438.

907 II. (£5. & R. N. for Champion.²)—BEN LUSCOMBE, Bowden, Yealmpton, Plymouth, for Coarswell Yellow Boy 4014, born August 20, 1910, bred by John Luscombe, Coarswell, Ughborough; s. Spriddlecombe Favourite 2507, d. Beauty 6th 7862 by Spriddlecombe Perfection 2509.

910 III. (£3.)—W. & H. WHITLEY, Primley Farm, Paignton, for Primley Excelsior 4153, born April 2, 1911; v. What I Wanted 1388, d. Coquette 6374 by Babland Boy 1793.

Class 137.—South Devon Bulls, calved in 1915. [3 entries.]

912 I. (£10.)—COL. THE RT. HON. F. B. MILD MAY, M.P., Flete, Ivybridge, for Lillian's Champion 6016, born Jan. 18; s. Bickham Beauty 4280, d. Lillian 10164 by Henry 6th 3179.

911 II. (£5.)—BENJAMIN BUTLAND, Leigham, Plympton, Devon, for Leigham Lumpy 6011 born Jan. 20; s. Worswell Gladiator 4237, d. Beauty 18th 10565 by Henry 7th 3178.

Class 138.—South Devon Cows or Heifers, in-milk, calved in or before 1913.

[6 entries.]

915 I. (£10.)—BEN LUSCOMBE, Bowden, Yealmpton, Plymouth, for Fidget 9261, born Jan. 2, 1909, calved Oct. 30, 1915; s. Challenger 1823, d. Fidget 4th 6615 by Silver King 1751.

914 II. (£5.)—BENJAMIN BUTLAND, Leigham, Plympton, for Beauty 17th 9760, born Oct. 8, 1910, calved May 18, 1916; s. Henry 7th 3178, d. Beauty 9th 6385 by Leigham Champion 1867.

916 III. (£3.)—PAGE & WHITLEY, Warren Hall, Broughton, Chester, for Hilda 3rd 7041, born May 12, 1906, calved June 15, 1916, bred by S. Cox, Coombe Fishacre, Ipplepen, Devon; s. Reformer 2212, d. Hilda 4879 by Netherton Hero 1599.

918 R. N.—W. & H. WHITLEY, Primley Farm, Paignton, for Pippin.

¹ £20 towards these Prizes were given by the South Devon Herd Book Society.

² Challenge Cup given by a Member of the R.A.S.E. interested in the breeding of South Devons, for the best Animal in Classes 136-139.

lxxx *Award of Live Stock Prizes at Manchester, 1916.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 139.—*South Devon Heifers, calved in 1914 or 1915.* [6 entries.]

- 920 I. (£10.)—BENJAMIN BUTLAND, Leigham, Plympton, for *Primrose* 13624, born September 25, 1914; s. *Worswell Gladiator* 4257, d. *Beauty* 8018 by *Sully's Champion* 2461.
 922 II. (£5.)—PAGE & WHITLEY, Warren Hall, Broughton, Chester, for *Warren Buttercup* 14289, born Feb. 12, 1914; s. *Primley Fossicker* 4534, d. *Crocus* 5th 6681 by *Bona Fide* 1594.
 925 III. (£3.)—W. & H. WHITLEY, Primley Farm, Paignton, for *Primley Hibernia* 14820, born April 8, 1914; s. *General* 4061, d. *Merafield Lavender* 9th 9806 by *Henry* 1st 2910.

Longhorns.¹

Class 140.—*Longhorn Bulls, calved in 1911, 1912, 1913 or 1914.*
 [3 entries.]

- 926 I. (£10. & Champion.²)—LORD GERARD, Eastwell Park, Ashford, Kent, for *Eastwell Empire* 562, plum brindle and white, born July 4, 1911; s. *Eastwell Emperor* 502, d. *Bentley Dido* by *Bentley Wonder* 373.
 927 II. (£5.)—F. A. NEWDEGATE, M.P., Arbury, Nuneaton, for *Arbury King* 568, brindle and white, born Nov. 8, 1911; s. *Dersingham Prince* 528, d. *Arden Fairy Queen* by *Prodigal* 510.
 928 III. (£3.)—W. HANSON SALE, Arden Hill, Atherstone, for *Arden King Maker* 645, brindle and white, born May 21, 1914; s. *Witherley Captain* 630, d. *Bilstone Sunlight* by *Bilstone Monarch* 374.

Class 141.—*Longhorn Bulls, calved in 1915.* [3 entries.]

- 929 I. (£10. & R.N. for Champion.³)—CAPT. C. W. COTTRELL-DORMER, Rousham, Steeple Aston, Oxon., for *Rousham Rambler*, dark brindle and white, born Feb. 6; s. *Rousham Rufus* 700, d. *Arden Pansy* 4th (vol. 5, p. 14), by *Young Bow Horn* 438.
 931 II. (£5.)—J. W. SWINNERTON-WESTON, Over Whitacre House, Birmingham, for *Whitacre Venture* 2nd, brindle and white, born June 12, bred by W. E. Swinnerton, Over Whitacre, Birmingham; s. *April Fool* 634, d. *Stivichall Doreen* (vol. 9, p. 63) by *Susan's Son* 515.
 930 III. (£3.)—F. A. NEWDEGATE, M.P., Arbury, Nuneaton, for *Arbury Admiral*, brindle and white, born April 29; s. *Arbury King* 568, d. *Arbury Duchess* (vol. 8, p. 38) by *Dersingham Prince* 528.

Class 142.—*Longhorn Cows or Heifers (in-milk), calved in or before 1913.*
 [2 entries.]

- 933 I. (£10. & R. N. for Champion.³)—W. HANSON SALE, Arden Hill, Atherstone, for *Arden Lady Panza* (vol. 8, p. 44), red and white, born April 28, 1910, calved June 17, 1916; s. *Putley Gay Lad* 546, d. *Lady Panza* by *Sanchez Panza* 385.
 932 II. (£5.)—LORD GERARD, Eastwell Park, Ashford, Kent, for *Rosette* (vol. 6, p. 24), red and white, born July 20, 1906, calved May 28, 1916, bred by Hon. W. A. Fitzroy, Fox Hill, West Haddon, Rugby; s. *Duke Lollo* 499, d. *Arden Rosebud* by *The Newton Bull* 396.

Class 143.—*Longhorn Heifers, calved in 1914 or 1915.* [3 entries.]

- 934 I. (£10. & Champion.³)—CAPT. C. W. COTTRELL-DORMER, Rousham, Steeple Aston, Oxon., for *Romp of Rousham* (vol. 9, p. 27), red, brindle and white, born June 7, 1914; s. *Rousham Robin* 615, d. *Arden Gipsy Queen* 2nd by *Putley Gay Lad* 545.
 936 II. (£5.)—F. A. NEWDEGATE, M.P., Arbury, Nuneaton, for *Arbury Barton* (vol. 9, p. 46), brindle and white, born March 8, 1914; s. *Arbury King* 568, d. *Arbury Winifred* by *Eastwell Eagle* 500.
 935 III. (£3.)—CAPT. C. W. COTTRELL-DORMER, for *Ruff of Rousham* (vol. 9, p. 28), brindle and white, born July 25, 1914; s. *Rousham Robin* 615, d. *Elegance of Eastwell* by *Westmeath Squire* 435.

¹ £20 towards these Prizes were given by the Longhorn Cattle Society.

² Perpetual Challenge Cup given by the Longhorn Cattle Society for the best Bull or Cow in Classes 140 and 142.

³ Silver Challenge Cup given through the Longhorn Cattle Society for the best Bull or Heifer in Classes 141 and 14.

Award of Live Stock Prizes at Manchester, 1916. lxxxii

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Sussex.¹

Class 144.—Sussex Bulls, calved in 1911, 1912, 1913, or 1914. [2 entries.]

- 937 I. (£10, & Champion.²)—J. RAYNER BETTS, Greenhill Farm, Otham, Maidstone, for Otham Oddfellow 4th 3282, born May 11, 1913; s. Oddfellow 2654, d. Lilac 8008 by Lord Comp 1776.
938 II. (£5.)—J. RAYNER BETTS, for Otham Oddfellow 8th 3573, born Oct. 30, 1914, s. Oddfellow 2654, d. Otham Barbara 12818 by Otham Oberon 2333.

Class 145.—Sussex Bulls, calved in 1915. [7 entries.]

- 943 I. (£10, & R. N. for Champion.²)—CAMPBELL NEWINGTON, Oakover, Ticehurst, for Oakover Gold 13th 3955, born Jan. 4; s. Oakover Gold 2nd 2970, d. Oakover Ellen 11010 by Rosario 1711.
945 II. (£5.)—W. A. THORNTON, Lock Farm, Partridge Green, Sussex, for Lock Rufus 3895, born Jan. 12; s. Tuttham Beau 3212, d. Lock Darkey 18328 by Tuttham Toreador 2016.
940 III. (£3.)—WALTER T. FREMLIN, Milgate Park, near Maidstone, for Milgate Nero 8th 3869, born Jan. 3; s. Tuttham Nero 2911, d. Brockhill Mayblossom 2nd 12292 by Evegate Prince 2235.
944 R. N.—THE REV. F. S. SOLATER, Newick Park, Lewes, for Newick Bush Briar. H. C.—941, 942.

Class 146.—Sussex Cows or Heifers (in-milk), calved in or before 1913. [3 entries.]

- 946 I. (£10, & R. N. for Champion.³)—JOHN AUNGIER, Lynwick, Rudgwick, for Lynwick Knelle Flirt 3rd 14623, born Jan. 11, 1913, calved Jan. 19, 1916; s. Lynwick Prebble 2637, d. Knelle Flirt 2nd 10610 by Boxley Prince 2027.
948 II. (£5.)—CAMPBELL NEWINGTON, Oakover, Ticehurst, for Favourite 21st 15061, born Feb. 12, 1910, calved Feb. 28, 1916, bred by Joseph Lucas, Foxhunt Manor, Horeham Road, Sussex; s. Orchardmains Squire 2475, d. Foxhunt Ellen 11993 by Tuttham Squire 2nd 2149.
947 III. (£3.)—JAMES GROVES, Brownings Manor, Blackboys, Sussex, for Ashburnham Bloom 11647, born Oct. 12, 1908, calved May 18, 1916, bred by the Earl of Ashburnham, Battle, Sussex; s. Limehurst Sailor 2035, d. Ashburnham Blossom 9138 by Bewbush Nobleman 3rd 1853.

Class 147.—Sussex Heifers, calved in 1914. [2 entries.]

- 950 I. (£10.)—JAMES GROVES, Brownings Manor, Blackboys, Sussex, for Lady Norah 8th 15591, born Jan. 6, bred by Gerald Warde, Tuttham, West Farleigh, Kent; s. Shillinglee Gold 2nd 2194, d. Apsley Norah 10144 by Duke of Drungewick 3rd 1808.
949 II. (£5.)—JOHN AUNGIER, Lynwick, Rudgwick, for Lynwick Rose 15361, born March 16; s. Drungewick K.C. 3rd 2862, d. Lady Goadolier Prebble 11457 by Prebble Confidence 2143.

Class 148.—Sussex Heifers, calved in 1915. [8 entries.]

- 951 I. (£10, & Champion.³)—JOHN AUNGIER, Lynwick, Rudgwick, for Lynwick Knelle Flirt 4th 16070, born Jan. 29; s. Lynwick Autocrat 2630, d. Knelle Flirt 2nd 10610 by Boxley Prince 2027.
953 II. (£5.)—JAMES GROVES, Brownings Manor, Blackboys, Sussex, for Brownings Crystal 1st 16280, born Jan. 15; s. Apsley Albert 2nd 2706, d. Limehurst Crystal 13439 by Drungewick Unionist 2nd 2923.
958 III. (£3.)—W. A. THORNTON, Lock, Partridge Green, Sussex, for Lock Rose 3rd 16595, born Jan 16; v. Tuttham Beau 3212, d. Rosina of Lock 12896 by Tuttham Toreador 2016.
954 R. N.—JAMES GROVES, for Brownings Lady Norah 1st. H. C.—955. O.—956.

Welsh.⁴

Class 149.—Welsh Bulls, calved on or between December 1, 1910, and November 30, 1913. [3 entries.]

- 959 I. (£10.)—C. H. LLOYD-EDWARDS, Nanhoron, Pwllheli, for Nanhoron Baronet 605, born Dec. 27, 1913; s. Robin Ddu 518, d. Nanhoron Necklace 1374 by Nanhoron Nimble 280.

¹ £20 towards these Prizes were given by the Sussex Herd Book Society.

² Champion Silver Medal given by the Sussex Herd Book Society for the best Bull in Classes 144 and 145.

³ Champion Silver Medal given by the Sussex Herd Book Society for the best Cow or Heifer in Classes 146-148.

⁴ £50 towards these Prizes were given by the Welsh Black Cattle Society.

lxxxii *Award of Live Stock Prizes at Manchester, 1916.*

[Unless otherwise stated each prize animal named below was "bred by exhibitor."]

901 II. (£5.) LORD PENRHYN, Penrhyn Castle, near Bangor, for Standard of Penrhyn 824, born Aug. 24, 1912; s. Madryn Cawr 488, d. Madryn Sally 1st 595 by Black Bear 390.

960 III. (£3.)—RICHARD NEWELL, Bachellyn, Pwllheli, for Wern Mancuria 565, born June 15, 1913, bred by R. M. Greaves, Wern, Portmadoc; s. Wern Jap 418, d. Wern Koran 1647 by Wern Inky 338.

Class 150.—Welsh Bulls, calved on or between December 1, 1913, and November 30, 1914. [1 entry.]

962 I. (£10.)—R. M. GREAVES, Wern, Portmadoc, for Wern Nonsuch 715, born Jan. 7, 1914, bred by J. Jones, Bryncian Fawr, Anglesey; s. Rheinfalt 610, d. Cwyfau Daisy 1747 by Plas Togo 249.

Class 151.—Welsh Bulls, calved on or between December 1, 1914, and November 30, 1915. [2 entries.]

963 I. (£10.)—R. M. GREAVES, Wern, Portmadoc, for Wern Nabob, born Dec. 6, 1914; s. Wern Lion 562, d. Wern Lucy 1650 by Wern Inky 338.

Class 152.—Welsh Cows (in-milk), calved on or before November 30, 1912.
[2 entries.]

965 I. (£10.)—R. M. GREAVES, Wern, Portmadoc, for Lydstep Sarah 1487, born Jan. 2, 1910, calved March 1, 1916, bred by T. E. Thomas, Trehal, Mathry; s. Hendre Boy 256, d. Sarah 5th 907 by Gorryg Boy 85.

966 II. (£5.)—RICHARD NEWELL, Bachellyn, Pwllheli, for Bachellyn Kitty 2333, born Sept. 5, 1911, calved March 6, 1916; s. Wern Gallant 332, d. Phebe 3rd by Bodrel Gwynhingar.

Class 153.—Welsh Heifers (in-milk), calved on or between December 1, 1912, and November 30, 1913. [No entry.]

Class 154.—Welsh Heifers, calved on or between December 1, 1913, and November 30, 1914. [3 entries.]

968 I. (£10.)—RICHARD NEWELL, Bachellyn, Pwllheli, for Bachellyn Nesta 2249, born March 26, 1914; s. Tudor 331, d. Bachellyn Idol 1789 by Madryn Mallard 298.

967 II. (£5.)—LORD HARLEBOR, Brogyntyn, Oswestry, for Glyn Europa 2093, born Jan. 28, 1914; s. Glyn Infidel 458, d. Glyn Cynfil 1015 by Penally Tip Top 107.

969 III. (£3.)—LORD PENRHYN, Penrhyn Castle, Bangor, for Mona 2nd of Penrhyn 2308, born Jan. 26, 1914; s. Madryn Cawr 488, d. Mona of Penrhyn 1816 by Madryn Madoc 297.

Class 155.—Welsh Heifers, calved on or between December 1, 1914, and February 28, 1915. [3 entries.]

972 I. (£10.)—E. H. J. WYNNE, Coed Cŵch, Abergale, for Sychtyn Rosa 3rd, born Feb. 20, 1915, bred by T. H. Vaughan, Sychtyn, Llanerfyl, Welshpool; s. Penilyn Duke 907, d. Sychtyn Rosa 2429 by Jack Jones 662.

970 II. (£5.)—O. H. LLOYD-EDWARDS, Nanhoron, Pwllheli, for Nanhoron Prejudice 2311, born Feb. 19, 1915; s. Glasfryn Tomas 609, d. Nanhoron Profuse 1783 by Robin Dan 518.

971 III. (£3.)—RICHARD NEWELL, Bachellyn, Pwllheli, for Bachellyn Olga 2253, born Jan. 22, 1915, bred by Peter Pugh, Farm Yard, Portmadoc; s. Penilyn Cawr 711, d. Cornbut by Llwynmafon Isaf.

Class 156.—Welsh Heifers, calved on or between March 1, 1915, and November 30, 1915. [5 entries.]

973 I. (£10.)—R. M. GREAVES, Wern, Portmadoc, for Wern Olive 2050, born June 15; s. Voelas Lion 712, d. Wern Heather 1002 by Duke of Wellington 264.

976 II. (£5.)—RICHARD NEWELL, Bachellyn, Pwllheli, for Bachellyn Olive 2257, born Sept. 21; s. Wern Mancuria 565, d. Aniel 1221 by The Shah 204.

977 III. (£3.)—RICHARD NEWELL, for Bachellyn Omaha 2256, born July 18; s. Bachellyn Lucifer 615, d. Bachellyn Mens 2243 by Pencae Cawr 440.
H. C.—874. O.—875.

Red Polls.¹

Class 157.—Red Poll Bulls, calved in 1911, 1912, or 1913. [4 entries.]

981 I. (£10, & Champion.²)—WILLIAM WOODGATE, Fairfield, Framlingham, Suffolk, for Redgrave Reveller 10475, born Jan. 12, 1912, bred by G. H. Wilson, Redgrave Hall, Diss; s. Benacre Pearl 9810, d. Pretty Flower 8th 22224 by Sturton Emperor 9335.

¹ £30 towards these Prizes were given by the Red Poll Cattle Society.

² Champion Prize of £5 given by the Red Poll Cattle Society for the best Bull in Classes 157-159.

Award of Live Stock Prizes at Manchester, 1916. lxxxiii

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

978 II. (£5, & R. N. for Champion.¹)—THOMAS BROWN & SON, Marham Hall, Downham Market, for Gay Davyson 10585, born April 4, 1913, bred by the late Alfred J. Smith, Rendlesham, Woodbridge; s. Davyson 265th 9230, d. Rendlesham Apricot 20517 by Rendlesham Sirdar 9810.

980 III. (£3.)—A. CARLYLE SMITH, Sutton Hall, Woodbridge, for Emperor 10410, born March 14, 1912, bred by G. Wilson, Redgrave Hall, Diss; s. Acton Saracen 9883, d. Pretty Flower 7th 21791 by Starston Emperor 9335.

Class 158.—Red Poll Bulls, calved in 1914. [7 entries.]

982 I. (£10.)—HIS MAJESTY THE KING, Sandringham, for Letton Majiolini 8th 10756, born Feb. 3, bred by Lord Cranworth, Letton Hall, Shipdham, Norfolk; s. Letton Majiolini 5th 10317, d. Letton Meadow Dell 6th 22643 by Letton Omega 2nd Davyson 10048.

983 II. (£5.)—THOMAS BROWN & SON, Marham Hall, Downham Market, for Marham Gay Lad, born April 27; s. Ashlyns Count 10125, d. Gaety 22572 by Davyson 224th 9059.

Class 159.—Red Poll Bulls, calved in 1915. [7 entries.]

988 I. (£10.)—THE MARCHIONESS OF GRAHAM, Easton Park, Wickham Market, for King Rufus 10882, born Feb. 10; s. King David 10183, d. Red River 21809 by Redskin 9623.

984 II. (£5.)—MAJOR D. ASTLEY, Little Plumstead Hall, Norwich, for Plumstead Petrolite 19092, born Jan. 2; s. Battleaxe 10142, d. Acton Candleberry 21960 by Acton Merlin 9657.

987 III. (£3.)—MAJOR SIR MERRIK BURRELL, BT., Knepp Castle, West Grinstead, for Knepp Mace, born Jan. 24; s. Battleaxe 10142, d. Ashlyns Ida 22414 by Ashlyns Duke 9323.

985 R. N.—W. E. BALSTON, Barvin, Potters Bar, for Barvin Derwent.
H. C.—986.

Class 160.—Red Poll Cows or Heifers (in-milk), calved in or before 1913.
[8 entries.]

997 I. (£10, & Champion.²)—THE MARCHIONESS OF GRAHAM, Easton Park, Wickham Market, for Ashlyns Fawn 21989, born May 15, 1909, calved Feb. 4, 1913, bred by the late Sir Richard Cooper, BT., Ashlyns, Berkhamsted; s. Ashlyns Major 9192, d. Ashlyns Flirt 19612 by Ashlyns Frinton 7804.

995 II. (£5, & R. N. for Champion.²)—KENNETH M. CLARK, Sudbourne Hall, Orford, Suffolk, for Sudbourne Pepper 22373, born Sept. 20, 1903, calved April 26, 1916; s. Sudbourne Spicy 9751, d. Eyke Prime Pear 19183 by Roger Knockin 8671.

991 III. (£3.)—HIS MAJESTY THE KING, Sandringham, for Acton Waxwing 22891, born April 21, 1911, calved Jan. 7, 1916, bred by the Trustees of the late Sir Walter Corbet, BT., Acton Reynold, Shrewsbury; s. Acton Saracen 9883, d. Waxlight 2nd 18965 by Royal Standard 8707.

992 R. N.—MAJOR D. ASTLEY, Little Plumstead Hall, Norwich, for Plumstead Peony.
H. C.—996.

Class 161.—Red Poll Heifers, calved in 1914. [8 entries.]

1000 I. (£10.)—W. E. BALSTON, Barvin, Potters Bar, for Barvin Daphne, born April 29; s. Ashlyns Wentworth 10263, d. Barvin Daffodil 21546 by Honingham Adjutant 9681.

1006 II. (£5.)—A. CARLYLE SMITH, Sutton Hall, Woodbridge, for Ashmoor Pearly 24438, born Jan. 7; s. Dax 9567, d. Ashmoor Peerless 22422 by Davyson 265th 9230.

1002 III. (£3.)—KENNETH M. CLARK, Sudbourne Hall, Orford, Suffolk, for Sudbourne Abundance 24877, born April 9; s. Acton Crowfoot 9987, d. Sudbourne Abbess 1st 21691 by Sudbourne Sirdar 9871.

1001 R. N.—THOMAS BROWN & SON, Marham Hall, Downham Market, for Handsome Plantain.
H. C.—999.

Class 162.—Red Poll Heifers, calved in 1915. [13 entries.]

1008 I. (£10.)—MAJOR D. ASTLEY, Little Plumstead Hall, Norwich, for Plumstead Powder Puff 25301, born Jan. 10; s. Battleaxe 10142, d. Charming Davy 16th 22495 by Starston Emperor 9335.

1014 II. (£5.)—KENNETH M. CLARK, Sudbourne Hall, Orford, Suffolk, for Sudbourne Beauteous, born Jan. 3; s. Acton Crowfoot 9987, d. Sudbourne Beautiful 21447 by Rendlesham Lad 9629.

1013 III. (£3.)—THOMAS BROWN & SON, Marham Hall, Downham Market, for Marham Flirt, born Jan. 18; s. Ashlyns Count 10125, d. Flutter 18046 by Wentworth 5257.

1012 R. N.—THOMAS BROWN & SON, for Marham Daffodil.
H. C.—1015. O.—1007.

¹ Champion Prize of £5 given by the Red Poll Cattle Society for the best Bull in Classes 157-159.

² Champion Prize of £5 given by the Red Poll Cattle Society for the best Cow or Heifer in Classes 160-162.

lxxxiv *Award of Live Stock Prizes at Manchester, 1916.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Aberdeen Angus.¹

Class 163.—Aberdeen Angus Bulls, calved on or between December 1, 1910, and November 30, 1913. [6 entries.]

- 1023 I. (£10, & R. N. for Champion.²)—JAMES KENNEDY, Doonholm, Ayr, for *Matador* of Bywell 34848, born Feb. 13, 1913, bred by Viscount Allendale Bywell Hall, Stocksfield; s. Juan Eric 30733, d. Matilda 8th of Aldbar 83355 by Mein Herr 16901.
 1022 II. (£5.)—GEORGE DRUMMOND, Swaylands, Ponshurst, Kent, for *Earl of Swaylands* 34250, born Jan. 7, 1913; s. Prior of Swaylands 32426, d. Eva of Hurley 38702 by Evolsurus 21908.
 1020 III. (£3.)—VISCOUNT ALLENDALE, Bywell Hall, Stocksfield, Northumberland, for *Elmstead* of Bywell 55896, born May 3, 1912; s. Elmshore 29122, d. Maquira of Birtley 39432 by Princely Gem of Birtley 22506.
 1024 R. N.—HENRY JAMES KING, Poles, Ware, Herts., for *Prince of March*.
 H. C.—1025. C.—1021.

Class 164.—Aberdeen Angus Bulls, calved on or between December 1, 1913, and November 30, 1914. [7 entries.]

- 1029 I. (£10, Champion³, & R. N. for Champion.²)—A. W. BAILEY HAWKINS, Stagenhoe Park, Welwyn, Herts, for *Black Baron of Dalmeny* 35544, born Dec. 29, 1913, bred by the Earl of Rosebery, K.G., Dalmeny Park, Edinburgh; s. Prince Buller 27336, d. Barrette of Careston 43185 by Benedictino 25318.
 1030 II. (£5.)—LORD PENRHYN, Wicken Park, Stony Stratford, Bucks, for *Wicken Reduse* 37110, born Feb. 1, 1914; s. Errant Knight of Wicken 33113, d. Joan of Wicken 46504 by Veronese 26460.
 1027 III. (£3.)—JOHN H. BRIDGES, Langshott, Horley, Surrey, for *Fleur-de-Lis* 36106, born Jan. 29, 1914; s. Gardafui of Ballindalloch 31967, d. Flower 26th of Strichen 41321 by Idealist 20647.
 1026 R. N.—VISCOUNT ALLENDALE, Bywell Hall, Stocksfield, for *Valindre*.
 H. C.—1028. C.—1031.

Class 165.—Aberdeen Angus Bulls, calved on or between December 1, 1914, and November 30, 1915. [12 entries.]

- 1035 I. (£10.)—J. J. CRIDLAN, Maisemore Park, Gloucester, for *Bartonia Jack of Coolcower* 37206, born Jan. 16, 1915, bred by R. C. Williams, Coolcower House, Maccroom, Co. Cork; s. Jack of Blandsfort 34667, d. Bartonia of Coolcower 61873 by Eino 27997.
 1034 II. (£5.)—SIR GEORGE A. COOPER, BART, Hursley Park, Winchester, for *Polled Piper* 38450, born Jan. 10, 1915, bred by Lord Penrhyn, Wicken Park, Stony Stratford; s. Prefect of Wicken 32346, d. Bona Pride 2nd 51288 by Kilmston 29124.
 1033 III. (£3.)—VISCOUNT ALLENDALE, Bywell Hall, Stocksfield, for *Proud George* 38696, born May 4, 1915, bred by A. T. Reid, Auchterarder House, Auchterarder; s. Romeo of Ballindalloch 29941, d. Proud Grace of Fishot 46552 by Gernie of Ballindalloch 28100.
 1041 R. N.—JOHN MCINTYRE, Thankston Hall, Bedale, for *Exning*.
 H. C.—1036, 1038.

Class 166.—Aberdeen Angus Cows or Heifers (in-milk), calved on or before November 30, 1913. [7 entries.]

- 1049 I. (£10, and Champion.²)—JAMES KENNEDY, Doonholm, Ayr, for *Ermonda* 52602, born March 19, 1913, calved Jan. 1, 1916; s. Mondello 27193, d. Ermona 39029 by Rosador 15990.
 1046 II. (£5.)—A. W. BAILEY HAWKINS, Stagenhoe Park, Welwyn, for *Eva of Bywell* 51793, born April 1, 1911, calved Jan. 16, 1916, bred by Viscount Allendale, Bywell, Stocksfield; s. Dawfield Texter 18948, d. Erica of Birtley 11039 by Burchius of Glamsis 14095.
 1045 III. (£3.)—J. J. CRIDLAN, Maisemore Park, Gloucester, for *Tulip of Standen* 45123, born Feb. 23, 1909, calved Dec. 1, 1915, bred by Captain F. Cookson, Chute Standen, Wilts; s. Elector of Benton 21814, d. Crocus of Standen 37038 by Ellberton 20135.
 1047 R. N.—A. W. BAILEY HAWKINS, for *Pride 3rd of Ruthven*.
 H. C.—1051. C.—1048.

Class 167.—Aberdeen Angus Heifers, calved on or between December 1, 1913, and November 30, 1914. [5 entries.]

- 1055 I. (£10.)—JAMES KENNEDY, Doonholm, Ayr, for *Effieda* 51618, born Jan. 1, 1914; s. Ellyn 23110, d. Ellen Terry 40745 by Evarn 20507.

¹ £20 towards these Prizes were given by the Aberdeen Angus Cattle Society.

² Gold Medal given by the English Aberdeen Angus Cattle Association for the best animal of the opposite sex to that of the animal awarded the Gold Medal of the Aberdeen Angus Cattle Society in Classes 163-168.

³ Gold Medal given by the Aberdeen Angus Cattle Society for the best animal in Classes 163-168.

Award of Live Stock Prizes at Manchester, 1916. lxxxv

- [Unless otherwise stated, each prize animal named below was "bred by exhibitor."]
 1054 II. (£5.)—JAMES KENNEDY, for Elavia 54617, born Jan. 25, 1914; s. Mondello 27193, d. Eloquunde 35111 by Just 17996.
 1056 III. (£3.)—JOHN MCINTYRE, Theakston Hall, Bedale, for Theakston Festive Miss 54777, born March 4, 1914; s. Prince Festive of Ballindalloch 26188 d. Theakston Proud Miss 40919 by Jim of Auchterarder 22072.
 1052 R. N.—SIR GEORGE A. COOPER, BART., Hursley Park, Winchester, for Juliana of Hursley.
 H. C.—1053.

Class 168.—Aberdeen Angus Heifers, calved on or between December 1, 1914, and November 30, 1915. [10 entries.]

- 1062 I. (£10.)—JAMES KENNEDY, Doonholm, Ayr, for Biota of Doonholm 56632, born Dec. 4, 1914; s. Mondello 27193, d. Bel-bam 48593 by Price List 17069.
 1057 II. (£5.)—JOHN HENRY BRIDGES, Langshott, Horley, for Jean of Langshott 55827, born Dec. 8, 1914; s. Gardafui of Ballindalloch 31867, d. Jillet 6th 50258 by Earwig of Glamis 29053.
 1060 III. (£3.)—J. J. CRIDLAN, Mainemore Park, Gloucester, for Simple of Maisemore 56058, born Feb. 13, 1915; s. Idart of Maisemore 33815, d. Sympathy 4th of Whiteside 52172 by Ventnor of Chapelton 30032.
 1061 R. N.—A. W. BAILEY HAWKINS, Stagenhoe Park, Welwyn, for Ena of Stagenhoe.
 H. C.—1065, 1066. O.—1058, 1059.

Galloways.¹

Class 169.—Galloway Bulls, calved on or between December 1, 1910, and November 30, 1914. [3 entries.]

- 1067 I. (£10, & Champion.)—DAVID BROWN, Stepford, Holywood, Dumfries for Jovial of Blackcombe 11716, born April 24, 1912, bred by Hugh Fraser, Arkland, Dalbeattie; s. Optimist 11033, d. Lady Nancy 3rd 17483 by Campfollower of Stepford, 7478.
 1069 II. (£5.)—ROBERT GRAHAM, Auchengassel, Twynholm, for Patriot of Ewanston, 12347, born Dec. 20, 1913, bred by John Gilchrist, Ewanston, New Galloway; s. Kenneth of Killearn 11370, d. Princess 3rd of Ewanston 23902 by Dover of Thorniehill 10860.

Class 170.—Galloway Bulls, calved on or between December 1, 1914, and November 30, 1915. [4 entries.]

- 1070 I. (£10.)—DAVID BROWN, Stepford, Dumfries, for Cockade 3rd of Stepford 12626, born May 23, 1915; s. Jovial of Blackcombe 11716, d. Constance of Stepford 21214 by Cairn of Stepford 3888.
 1072 II. (£5.)—FRANCIS N. M. GOURLAY, Milnton, Tynron, Thornhill, Dumfriesshire, for Sir Rupert of Craigneston 12729, born May 21, 1915; s. Outhbert 2nd 11696, d. Rosetta of Craigneston 21453 by Keystone 9689.
 1073 III. (£3.)—ROBERT GRAHAM, Auchengassel, Twynholm, for Royalty of Auchengassel 12747, born April 2, 1915; s. Black Prince 11622, d. Nora of Auchengassel 22596 by Ollax 10020.

Class 171.—Galloway Cows or Heifers (in-milk), calved on or before November 30, 1913. [2 entries.]

- 1074 I. (£10, & R. N. for Champion.)—SIR ROBERT W. BUCHANAN-JARDINE, BT., Castlemilk, Lockerbie, for Lady Lee 3rd of Castlemilk 19086, born Oct. 10, 1906, calved May 2, 1916; s. Black Douglas 4th of Castlemilk 8056, d. Lady Lee of Castlemilk 15910 by Maharrjah 6813.
 1076 II. (£5.)—ROBERT GRAHAM, Auchengassel, Twynholm, for Marion 3rd of Glentriplock 19324, born Jan. 13, 1905, calved Jan. 4, 1916, bred by Peter Anderson, Glentriplock, Port William; s. Freelance 8073, d. Marion 2nd of Glentriplock 17011 by Balmoral 6386.

Class 172.—Galloway Heifers, calved on or between December 1, 1913, and November 30, 1914. [2 entries.]

- 1076 I. (£10.)—FRANCIS N. M. GOURLAY, Milnton, Tynron, Thornhill, Dumfriesshire for Lady Stanley 31st of Chapelton 23886, born Jan. 20, 1914, bred by Thomas Biggar and Sons, Chapelton, Dalbeattie; s. Kingsley 11130, d. Lady Stanley 37th of Chapelton 21856 by Sweetstakes 10001.
 1077 II. (£5.)—ROBERT GRAHAM, Auchengassel, Twynholm, for Sally 2nd of Auchengassel 24029, born May 21, 1914; s. Legacy of Auchengassel 10902, d. Our Sally 18674 by Brucina 3rd of Drumlanrig 8045.

¹ £20 towards these prizes were given by the Galloway Cattle Society.

² Champion Prize of £5 and the Dr. Gillespie Memorial Trophy given by the Galloway Cattle Society for the best animal in Classes 169-173.

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 173.—Galloway Heifers, calved on or between December 1, 1914, and November 30, 1915. [4 entries.]

- 1081 I. (£10).—ROBERT GRAHAM, Auchengassel, Twynholm, for Rosy of Auchengassel 24646, born Feb. 18, 1915; s. Legacy of Auchengassel 10903, d. No-egay of Auchengassel 22594 by War Boy 10176.
 1078 II. (£5).—THOMAS BIGHAM & SONS, Chapelton, Dalbeattie, for Maggie 20th of Chapelton 24431, born Feb. 18, 1915; s. Hero of Thorniehill 13010, d. Maggie 2nd of Chapelton 18414 by Free Lance 8073.
 1080 III. (£3).—FRANCIS N. M. GOURLAY, Milnton, Tynron, Thornhill, Dumfriesshire, for Freda 4th of Craigneston 24635, born Dec. 17, 1914; s. Outhbert 2nd 11896, d. Favourite of Craigneston 19625 by Pioneer of Kilquhanity 8470.
 1079 E. N.—FRANCIS N. M. GOURLAY, for Brownie of Craigneston.

Ayrshires.¹

Class 174.—Ayrshire Bulls, calved in or before 1915. [No entry.]

Class 175a.—Ayrshire Cows or Heifers (in-milk). [6 entries.]

- 1087 I. (£10).—WILLIAM KERR, Old Graitney, Greta, Carlisle, for Old Graitney Bright Queen 33444, red, born in October, 1911, calved June 1, 1916; s. Old Graitney Silver Heel 8409, d. Old Graitney Bright Lady 17802 by Sir John of Old Graitney 4035.
 1084 II. (£5).—ALEX. CROSS, Knockdon, Maybole, for Meikle Kilmory Rose of Bute 4th 41700, white and brown, born in April, 1911, calved June 23, 1916, bred by Mrs. McAllister, Meikle Kilmory, Rothesay; s. Bruchug Ardyne 7453, d. Meikle Kilmory Rose of Bute 2nd 25696 by White Prince 6414.
 1082 III. (£3).—ALEX. CROSS, for Knockdon Diana 23105, white and brown, born April 15, 1908, calved June 6, 1916; s. St. Barchan of Manswrae 4839, d. Knockdon Lady Diana 16726 by Kings Knight 4886.

Class 175b.—Ayrshire Cows or Heifers (in-calf).

- 1083 I. (£10).—ALEX. CROSS, Knockdon, Maybole, for Knockdon Loudoun Lassie 7th 32094, brown and white, born March 14, 1912; s. Oarston St. Thomas 7904, d. Knockdon Loudoun Lassie 4th 17315 by Danger 4826.
 1085 II. (£5).—WILLIAM GIBSON, Moorside Farm, Worston, Olitheroe, for Auchinclough Etta 48480, white and brown, born March 11, 1914, bred by William Bone, Auchinclough, Galston; s. Netherhall Scotland Jet 8476, d. Auchinclough Bell 28530 by Brae Rising Star 8187.

Holstein-Friesians.²

The letters F.R.S. after the number of an animal indicates that such animal is registered in the Friesch Rundvee Stamboek (Friesland Cattle Herd Book) Zwartebonte (Black and White) Section.

The letters H., F.R.S., refer to the Hulpestamboek (Auxiliary Herd Book) Zwartebonte (Black and White) Section of the Friesch Rundvee Stamboek.

Unless otherwise stated, the numbers refer to the British Holstein-Friesian Herd Book.

Class 176.—Holstein-Friesian Bulls, calved in or before 1913. [4 entries.]

- 1088 I. (£10).—JOHN BROMET, Golf Links Farm, Tadcaster, for Golf (Imported) Botermijn 3919, born Feb. 19, 1913, bred by G. R. Miedema, Leonwarden, Holland; s. Buringa 50th 5511 F.R.S., d. Kalma 27596 II., F.R.S.
 1089 II. (£5).—I. B. and H. L. JARMAY, Bulkeley Hall, Malpas, for Bulkeley (Imported) Miltje's Ceres 3625, born Nov. 3, 1913, bred by N. S. Kinsma, Boxum, Holland; s. Jonge Ceres 5896 F.R.S., d. Miltje 7th 20584 F.R.S., by Frits 4539 F.R.S.
 1091 III. (£3).—RALPH WILLIAMSON, Rhed Broughton Home Farm, Wrexham, for Gilston Touchstone 1324, born April 18, 1911, bred by A. S. Bowiby, Gilston Park, Harlow; s. Gilston Prince 221, d. Gilston Kvelyn 1266.
 1090 E. N.—F. W. D. ROBINSON, Roos Hall, Beccles, for Beccles (Imported) Lodswijk.

Class 177.—Holstein-Friesian Bulls, calved in 1914. [6 entries.]

- 1093 I. (£10).—HUGH BROWN, Colton Mains, Dunfermline, for Colton (Imported) Vic Bram 3705, born Jan. 14, bred by J. A. Palmira, Wirdum, Holland; s. Victor 6107 F.R.S., d. Jeltje 2nd 19212 F.R.S. by Brouwer 3539 F.R.S.
 1092 II. (£5).—A. & J. BROWN, Hedges Farm, St. Albans, for Hedges (Imported) Fokke 2nd 3993, born March 1, bred by Messrs. Schnap, Deersum, Holland; s. Ceres 4497 F.R.S., d. Fokje 5th 18395 F.R.S., by Jan 3049 F.R.S.

¹ £20 towards these Prizes were given by the Ayrshire Cattle Herd Book Society.

² £35 towards these Prizes and Silver Medals for the First Prize winners in each Class were given by the British Holstein-Friesian Cattle Society.

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

1097 III. (£3.)—MRS. TOWNSEND, Gorstage Hall, Sandiway, Cheshire, for *Gorstage* (imported) *Mistje's Victor* 8939, born March 3, bred by N. S. Kingma, Boxum, Holland; s. *Victor* 6107 F.R.S., d. *Mietje* 5th 18918 F.R.S. by *Friso* 3771 F.R.S.

1095 B. N.—ANDREW F. CHILLINGWORTH, Reddown Farm, Highworth, Wilts, for *Reddown* (imported) *Murk*.

Class 178.—*Holstein-Friesian Bulls, calved in 1915.* [11 entries.]

1103 I. (£10.)—LIEUT.-COL. W. E. HARRISON, Wychnor Park, Burton-on-Trent, for *Wychnor Bonny Boy* 5757, born March 31; s. *Lavenham Duke* 1601, d. *Lavenham Blackheart* 5th 9834.

1098 II. (£5.)—A. S. BOWLBY, Gilston Park, Harlow, for *Gilston King of Roses* 5113, born Jan. 1; s. *Hedges Prince of Doncaster* 1465, d. *Gilston Dorothy* 828 by *Gilston Jack* 209.

1106 III. (£3.)—W. G. PLAYER, Lenton Hurst, Nottingham, for *Ednaston Champion* 5057, born March 17; s. *Ohaddecyen Champion* 2403, d. *Park Gerry* 3120 by *Park De Wet* 547.

1101 B. N.—A. & J. BROWN, Hedges Farm, St. Albans, for *Hedges King George*.

Class 179.—*Holstein-Friesian Cows (in-milk), calved in or before 1912.*

[7 entries.]

1110 I. (£10.)—A. & J. BROWN, Hedges Farm, St. Albans, for *Park Buttercup* 3093, born 1905, calved May 17, 1916, bred by Mrs. Case, Stanfield, East Dereham.

1114 II. (£5.)—MAJOR G. R. POWELL, Tynewydd, Hirwain, Glamorgan, for *Cymric St. Kilda* 7194, born Jan. 23, 1909, calved May 30, 1916; s. *Royal Duke*, d. *Cymric St. Albans of Marden* 7193 by *Hastings*.

1115 III. (£3.)—RALPH WILLIAMSON, Rhyd Broughton Home Farm, Wrexham, for *Blackmore Buttercup* 5844, dun and white, born in 1910, calved June 18, 1916, bred by A. Steel, South End.

1109 B. N.—MRS. T. E. BROOKS, The Manor House, Harbury, Leamington, for *Meadowend Pearl*.

Class 180.—*Holstein-Friesian Heifers (in-milk), calved in 1913 or 1914.*

[7 entries.]

1121 I. (£10.)—RALPH WILLIAMSON, Rhyd Broughton Home Farm, Wrexham, for *Gilston Philanthropy* 14812, born Oct. 10, 1913, calved May 23, 1916, bred by A. S. Bowlby, Gilston Park, Essex; s. *Gilston Touchstone* 1325, d. *Gilston Alma* 1250.

Class 181.—*Holstein-Friesian Heifers, calved in 1915.* [20 entries.]

1128 I. (£10.)—JOHN BROMET, Golf Links Farm, Tadcaster, for *Golf Madge* 21170, born Feb. 10; s. *Monkton Man of Kent* 529, d. *Golf Mabel* 8294.

1130 II. (£5.)—RICHARD FORD, Garton, Driffield, for *Garton Bouquet* 2nd 21116, born Feb. 16; s. *Garton Parker* 1291, d. *Routh Bouquet* 3292 by *Routh Bandmaster* 585.

1126 III. (£3.)—A. & J. BROWN, Hedges Farm, St. Albans, for *Hedges Froukje* 4th 21376, born Aug. 20; s. *Knebworth* (imported) *Ossar* 4085, d. *Hedges* (imported) *Froukje* 3rd 18050 by *Ceres* 4497, F.R.S.

1125 IV. (£2.)—A. & J. BROWN, for *Hedges Bush Gem* 21368, born April 2; s. *Hedges Bush Man* 265, d. *Hedges Split Gem* 1908.

1138 B. N.—HARRINGTON PAGE, Mill House, Tadcaster, for *Mill Flora*.
O.—1124, 1129, 1142.

Jerseys.¹

N.B.—In the Jersey Classes, the number inserted within brackets after the name of an animal indicates the number of such animal in the *Island Herd Book*. A number without brackets indicates that the animal is registered in the *English Jersey Herd Book*.

Class 182.—*Jersey Bulls, calved in 1911, 1912, or 1913.*

[4 entries.]

1146 I. (£10, & Champion.²)—W. M. JACKSON, Leggatts, Potters Bar, for *Mabel's Star* 11413, whole colour, born April 14, 1912, bred by W. J. Labey, Grouville, Jersey; s. *Fontaine's Star* 10951, d. *Mabel* 55th by *Fairy Lad* 9907.

1143 II. (£5, & R. N. for Champion.²)—JOSEPH CARSON, Crystalbrook, Theydon Bois, Essex, for *Minley's Self Acting*, whole colour, born July 4, 1913, bred by Springate and Baker, Grouville, Jersey; s. *Self Acting* 11147, d. *Minley* 10394.

1145 III. (£3.)—MISS ENDERBY, Beckington, Bath, for *Myrtles Hero*, whole colour, born April 18, 1913, bred by W. Syvret, Jun., St. Ouen, Jersey; s. *Royal Guide* (10077), d. *Myrtles Pride* (12993).

¹ £30 towards these Prizes were given by the English Jersey Cattle Society.

² Champion Prize of £5 given by the English Jersey Cattle Society for the best Bull in Classes 182-184.

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 183.—Jersey Bulls, calved in 1914. [7 entries.]

- 1147 I. (£10).—JOSEPH CARSON, Crystalbrook, Theydon Bois, for Construction, whole colour, born Feb. 28, bred by E. Cabot, Jersey, s. Self Acting 11147, d. Instructive 10870.
 1148 II. (£5).—DR. H. CORNER, Brook House, Southgate, Middlesex for Commodore, broken colour, born Feb. 16, bred by Mrs. Evelyn, Wotton House, Dorking; s. Yeovil Lad 10838, d. Comodora (vol. 19, p. 275) by Raleigh 7974.
 1150 III. (£3).—LIEUT.-COL. THE HON. H. G. HENDERSON, M.P., Kitemore, Faringdon, Berks, for Buster, whole colour, born Feb. 15, bred by A. T. Starck, St. Martin's, Jersey; s. Combination's Premier 10908, d. Bustle (10100).
 1152 R. N.—CHARLES THELLUSSON, Brodsworth Hall, Doncaster, for Sammy.
 H. C.—1151, 1153. C.—1149.

Class 184.—Jersey Bulls, calved in 1915. [11 entries.]

- 1158 I. (£10).—CAMPBELL LAVERTON, Windmill Cottage, Leighton, Westbury, Wilts., for Beckington Champion 2nd, whole colour, born April 17, bred by Mrs. Enderby, Beckington, Bath; s. Beckington Champion 11220, d. Dandy May (18955) by Western King 11198.
 1163 II. (£5).—CHARLES THELLUSSON, Brodsworth Hall, Doncaster, for Arcadia's Hero, whole colour, born March 11; s. Oracle's Golden Noble 11700, d. Arcadia (vol. 2, p. 241) by Stormer 9431.
 1160 III. (£3).—ALEXANDER MILLER-HALLETT, Goddington, Chelmsfield, Kent, for Pioneer's Noble, whole colour, born March 21, bred by E. H. Leonard, St. Owen's Jersey; s. Golden Fern's Noble (4570), d. Boutilliers (9870) by Fancy's Pioneer (3185).
 1164 IV. (£2).—LADY WERNHER, Luton Hoo, Luton, for Belgian King, whole colour, born April 5, bred by Mrs. J. Le Masures, St. Owen's, Jersey; s. Cuthlan Boy (4476), d. Kathleen 4th (8065) by Marquis (2125).
 1154 R. N.—G. H. BRAVINGTON, Longshaw, Chipstead, Surrey, for Moonraker.
 H. C.—1156. C.—1159.

Class 185.—Jersey Cows (in-milk), calved in or before 1912.

[22 entries.]

- 1171 I. (£10, & Champion. 1).—W. M. JACKSON, Leggett's, Potters Bar, for Pretty Victress (vol. 25, p. 437), whole colour, born Nov. 6, 1910, calved May 2, 1912, bred by O. Quenault, St. Saviour's, Jersey; s. Bess Noble 10528, d. Hamley's Victress (12068) P.S.H.C. by Hamley's Golden Lad 7534.
 1172 II. (£5, & R. N. for Champion. 1).—MRS. C. M. MCINTOSH, Havering Park, Romford, for Glorialis (vol. 25, p. 341), whole colour, born March 23, 1911, calved May 10, 1912, bred by J. Joyce, Poulton Priory, Fairford; s. Fairy's Duc 10597, d. Gloriana by Chief Justice 7138.
 1179 III. (£3).—J. H. SMITH-BARRY, Stowell Park, Pewsey, Wilts., for Marionette (vol. 18, p. 359), fawn, born Oct. 3, 1904, calved April 22, 1912; s. Gay Boy 7610, d. Margold by Sportive 7057.
 1185 IV. (£2).—LADY WERNHER, Luton Hoo, Luton, for Bombay's Pet 4th, broken colour, born March 30, 1911, calved May 24, 1912, bred by J. G. Onevalier, St. Owen's, Jersey; s. Gipsy's Noble 10249, d. Bombay's Pet 3rd (vol. 26, p. 240) by Highfield Lad 8926.
 1174 R. N.—ALEXANDER MILLER-HALLETT, Goddington, Chelmsfield, for Goddington Franchise.
 H. C.—1178, 1182. C.—1175, 1184, 1186.

Class 186.—Jersey Heifers (in-milk), calved in 1913. [8 entries.]

- 1192 I. (£10).—J. H. SMITH-BARRY, Stowell Park, Pewsey, Wilts., for Masquerade, grey fawn, born Feb. 13, calved May 6, 1913; s. Redruth 10407, d. Marionette (vol. 18, p. 359) by Gay Boy 7610.
 1187 II. (£5).—G. H. BRAVINGTON, Longshaw, Chipstead, Surrey, for Goddington Flower 4th, broken colour, born April 4, calved April 19, 1913, bred by Alexander Miller-Hallett, Goddington, Chelmsfield; s. Golden Chance's Noble 10260, d. Young Winks 4th (vol. 20, p. 498) by Flower's Hero 8615.
 1191 III. (£3).—ALEXANDER MILLER-HALLETT, Goddington, Chelmsfield, Kent, for Cowship 61st, whole colour, born July 7, calved June 1, 1913, bred by L. Falla, St. John's, Jersey; s. Oxford You'll Do (9724), d. Cowship 46th (17040) by Noble of Oaklands 9366.
 1188 R. N.—JOSEPH CARSON, Crystalbrook, Theydon Bois, for Euxesis.
 H. C.—1180. C.—1189.

Class 187.—Jersey Heifers (in-milk), calved in 1914. [7 entries.]

- 1195 I. (£10).—JOSEPH CARSON, Crystalbrook, Theydon Bois, for Combination's Favourite, born Feb. 4, calved May 3, 1914, bred by Charles Renouf, Jersey; s. Noble Combination 4914, d. Family Favourite (10507).

¹ Champion Prize of £5 given by the English Jersey Cattle Society for the best Cow or Heifer in Classes 185, 186, 187, and 189.

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(Unless otherwise stated, each prize animal named below was "bred by exhibitor.")
 1291 II. (55.)—LADY WERNHER, Luton Hoe, Luton, for Fairness, whole colour, born Feb. 7, calved May 19, 1916; s. China's Fairy Boy 9509, d. Neatness 10th (vol. 18, p. 274) by Harvester 8544.

1200 III. (53.)—CHARLES THELLUSSON, Brodsworth Hall, Doncaster, for Brodsworth Doris, whole colour, born March 29, calved March 29, 1916; s. Winks Noble 10536, d. Lady Dora 4th (vol. 22, p. 340) by Stormer 8431.

1198 E. N.—MISS ENDERBY, Beckington, Bath, for Veda's Cowalip.
 H. C.—1196.

Glass 188.—*Jersey Cows or Heifers (in-milk), bred by Exhibitor, and raised in Great Britain or Ireland.* [12 entries.]

1192 I. (516.)—J. H. SMITH-BARRY, for Masquerade. (See Class 186.)

1179 II. (55.)—J. H. SMITH-BARRY, for Marionette. (See Class 186.)

1174 III. (53.)—ALEXANDER MILLER-HALLETT, Goddington, Chalfield, Kent, for Goddington Franchise (vol. 24, p. 295), broken colour, born April 5, 1912, calved April 20, 1916; s. Goddington Noble 13261, d. La Franchise 3rd by Mabel's Raleigh 9820.

1173 E. N.—J. H. SMITH-BARRY, for Lightsome.
 H. C.—1201.

Glass 189.—*Jersey Heifers, calved in 1915.* [6 entries.]

1201 I. (516.)—J. H. SMITH-BARRY, Sloppa Park, Fenny Witten, for Blue Beacon, born April 24; s. Red Cloud 1238, d. Haywood Blushell (vol. 20, p. 327) by Blue Justice 1136.

1200 II. (55.)—LT. COL. THE HON. H. G. HENDERSON, M.P., Kilmara, Farningham, for Augusta, whole colour, born June 30; s. Noble of Beechwood 1129, d. Neatness (vol. 22, p. 277) by Fairy's Duc 10597.

1204 III. (53.)—W. M. JACKSON, Longgate, Potters Bar, for Slim Jim's Lass, born May 18; s. Slim Jim 5097, d. Jolly Tidy by Ovelone 2nd 11274.

1202 E. N.—LADY WERNHER, Luton Hoe, Luton, for Sapphire 2nd.

1179 1915 1916 (52.)—J. H. SMITH-BARRY, for Marionette, Masquerade.
 H. C.—1196.

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 192. *Guernsey Bulls, calved in 1916.* [9 entries.]

- 1225 I. (£10.) MRS W. HOWARD PALMER, Murrell Hill, Binfield, Berks., for Murrell Gay Boy 3102, dark fawn and white, born Aug 9; s. Lake Jolly Boy 2613, d. Hartfield Venus 8538 by Gay Boy 2020
- 1227 II. (£5.)—FRANK PRATT-BARLOW, Lynchmere House, Haslemere, for Lynchmere Lord Roberts 8th 3178, fawn and white, born Sept. 20; s. Robert's Boy's Sequel 2496, d. Clatford Fay of the Mill 8012 by Chisletain 62 F.S., R.G.A.S.
- 1228 III. (£3.)—J. F. REMNANT, M.P., The Grange, Twyford, Berks., for Dene Daystar 3110, fawn and white, born May 11; s. Dene Dandy 2720, d. Romana 26th 6684 by Reliance of La Lande 1615
- 1226 B. N.—MRS W. HOWARD PALMER, for Murrell Jolly Boy.
H. C.—1221, 1229.

Class 193.—*Guernsey Cows (in-milk), calved in or before 1911.*

[14 entries.]

- 1236 I. (£10. & Champion.)—A W. BAILEY HAWKINS, Stagenhoe Park, Welwyn, Herts., for Stagenhoe Rose of Gold 1st 11692, fawn and white, born Nov. 20, 1910, calved April 28, 1916, bred by R. E. Onilcott, Clovelly, St. Andrew's, Guernsey.
- 1240 II. (£5. & R.N. for Champion.)—J. F. REMNANT, M.P., The Grange, Twyford, Berks., for Donnington Jane 8034, fawn and white, born Nov. 14, 1909, calved May 5, 1916, bred by A. O. Harris, Donnington Manor, Chichester; s. Lord Howe of Warren Wood 1962, d. Donnington Beauty 5418 by Apne Frederic 1075.
- 1239 III. (£3.)—FRANK PRATT-BARLOW, Lynchmere House, Haslemere, for Rose of Goodnestone 2nd 7845, fawn and white, born Aug. 30, 1908, calved April 20, 1916, bred by H. Fitzwalter Plumtree, Goodnestone Park, Canterbury; s. Fleur-de-Lys 1565, d. Seaview Rose 8921 by Billy.
- 1241 B. N.—J. F. REMNANT, M.P., for Lemon Queen 3rd.
H. C.—1230, 1231, 1237.

Class 194.—*Guernsey Cows or Heifers (in-milk), calved in 1912 or 1913.*

[6 entries.]

- 1248 I. (£10.)—J. F. REMNANT, M.P., The Grange, Twyford, Berks., for Romana 49th 8659, fawn and white, born Feb. 15, 1912, calved April 15, 1916, bred by the late Spencer Trower, Stanstead Bury, Ware; s. Lennard 2nd 2162, d. Romana 26th 6684 by Reliance of La Lande 1615.
- 1244 II. (£5.)—G. F. FERRAND, Morland Hall, Alton, Hants, for Topsy of La Hougue 10380, light red, born Feb. 4, 1912, calved June 19, 1916, bred by N. J. Haeume, La Hougue, Vale, Guernsey; s. Clara's Sequel 2207 P.S., R.G.A.S., d. Topsy of Moulpied 6984 P.S., R.G.A.S. by Nelson of Moulpied 1555 P.S., R.G.A.S.
- 1246 III. (£3.)—MRS W. HOWARD PALMER, Murrell Hill, Binfield, Berks., for Donata 7th of Warren Wood 9949, fawn and white, born Jan. 21, 1913, calved Feb. 18, 1916, bred by the late J. L. Smail, Warren Wood, Hayes; s. Godolphin Bar Gold 2136, d. Donnington Everweat 8113 by Donnington Lad 1389.

Class 195.—*Guernsey Heifers, calved in 1914.* [6 entries]

- 1255 I. (£10.)—FRANK PRATT-BARLOW, Lynchmere House, Haslemere, for Lynchmere Violet 10822, fawn and white, born May 2; s. Robert's Boy's Sequel 2496, d. Violet of the Vrangue 9246 by Masher of King's Mills Lodge 2296 P.S., R.G.A.S.
- 1253 II. (£5.)—MRS W. HOWARD PALMER, Murrell Hill, Binfield, Berks., for Murrell Loyal 10552, fawn, born April 16; s. Hayes Fido 2nd 2460, d. Hayes Loyal 5th 9002 by Gay Boy 2020.
- 1250 III. (£3.)—W. H. N. GOSCHEN, Durrington House, Harlow, Essex, for Favour's Charmar 10894, fawn and white, born April 29, bred by H. Goschen, Heathfield, Addington, Croydon; s. Royal Favour 2508, d. Maid of Lindley 2nd 7751 by Lad of Bargate 1780.
- 1252 B. N.—MRS JERVOISE, Herriard Park, Basingstoke, for Trewidden Golden Cherry 3rd.
H. C.—1251.

Class 196.—*Guernsey Heifers, calved in 1915.* [14 entries.]

- 1263 I. (£10.)—MRS JERVOISE, Herriard Park, Basingstoke, for Daisymaid of St. Helene 11231, fawn and white, born May 25, bred by M. Ozenn, St. Helene, Guernsey; s. Flower Boy of the Cloture 3377 P.S., R.G.A.S., d. Daisymaid 3rd of la Houquette 12836 P.S., R.G.A.S.
- 1257 II. (£5.)—G. F. FERRAND, Morland Hall, Alton, Hants, for Morland Edelweiss 11560, red fawn, born June 30, s. Reliance of Morland 2835, d. Topsy of La Hougue 10380 by Clara's Sequel 2207 P.S., R.G.A.S.
- 1262 III. (£3.)—A W. BAILEY HAWKINS, Stagenhoe Park, Welwyn, Herts., for Stagenhoe Rose of Gold 2nd 11700, fawn and white, born June 16; s. Sailor King 3364 P.S., R.G.A.S., d. Stagenhoe Rose of Gold 11692.
- 1264 B. N.—MRS JERVOISE, for Livia of Les Vauxbelats.
H. C.—1258, 1259. C.—1256, 1261, 1265, 1268, 1269.

¹ Champion Prize of £5 given by the English Guernsey Cattle Society for the best Cow or Heifer in Classes 193-196.

Award of Live Stock Prizes at Manchester, 1916. xci

[Unless otherwise stated, each prize animal named below was "bred by exhibitor"]

Kerries.¹

N.B.—In the Kerry Classes, the number inserted within brackets after the name of an animal indicates the number of such animal in the Irish Kerry Herd Book. A number without brackets indicates that the animal is registered in the English Kerry Herd Book

Class 197.—Kerry Bulls, calved in 1911, 1912, 1913, or 1914 [3 entries.]

1270 I (£10, & Champion.²)—S J BROWN Ard Oasin Naas Co Kildare, for Shamrock Brian Sheen (351), born March 24, 1913 bred by P Taffe Foxborough, Olooneyquin, Elphin, Co Roscommon, s Shamrock Brian Borohm (392) d Shamrock Sheen (373) by Gort Lord Edward (632)

1271 II. (£5, & R. N. for Champion.³)—R TAIT ROBERTSON, The Hutch, Malahide Co Dublin, for Kilmorna Lord 13th (760) born March 15, 1912 bred by G Gun Mahoney Kilmorna, Co Kerry s Kilmorna Lord 6th (698), d Kilmorna Waterville (3562) by Kilmorna Duke 9th (624)

1272 R. N. & Champion.⁴—MAJOR E ROYDS M.P. Holy Cross, Caythorpe Grantham for Minley Nigger 348 born May 5, 1913, bred by L. Currie, Minley Manor, Farnborough, s La Mancha Paddy 258, d Duv Rosebud 1370 by Duv D unel (640)

Class 198.—Kerry Cows or Heifers (in-milk), calved in or before 1913.

[5 entries.]

1277 I. (£10.)—MAJOR E ROYDS M.P. Holy Cross, Caythorpe Grantham for Caythorpe Jewel 1361 born July 21 1908 calved May 10, 1916, s Caythorpe Gort Major 203, d Caythorpe Bennet 727 F.S.

1275 II. (£5)—S J BROWN Ard Oasin Naas Co Kildare for Maid of Ard Oasin (1588) born Feb 20 1910 calved May 18 1916 bred by D. Courtney, College Street, Killarney, s Paddy (484), d Belinda (3330)

1274 R. N.—S J BROWN, for Gort Dainty 3rd.
H. C.—1276

Class 199.—Kerry Heifers, calved in 1914 or 1915. [1 entry]

1278 I. (£10.)—R TAIT ROBERTSON The Hutch Malahide Co Dublin for La Mancha Mamma 1913, born April 4 1914, s Castlelough Duke 293, d Walton Oan Can 935 F.S.

Dexters.⁴

N.B.—In the Dexter Classes, the number inserted within brackets after the name of an animal indicates the number of such animal in the Irish Dexter Herd Book. A number without brackets indicates that the animal is registered in the English Dexter Herd Book

Class 200.—Dexter Bulls, calved in 1911, 1912, 1913, or 1914. [6 entries.]

1284 I. (£10, & R. N. for Champion.⁵)—R TAIT ROBERTSON, The Hutch Malahide, Co Dublin, for La Mancha Tom Tucker (613), born May 12, 1914, s Home Rule (588), d Castlelough Blackberry (2438) by Gort Sam 2nd (555)

1281 II. (£5)—H M GIBBS Barlow Court, Flax Bourton, Bristol, for Orpheus, born June 8 1914 bred by Hon John Ward, Ohilton, Hungerford Berks s Barrow Orphan 498 d La Mancha Molly Maguire 1968 by Castlelough Billy (550)

1279 R. N.—HIS MAJESTY THE KING, Sandringham, for Robin Adair.

H. C.—1282 1283 O.—1280

Class 201.—Dexter Cows or Heifers (in-milk), calved in or before 1913

[10 entries.]

1285 I. (£10, & Champion.⁶)—HIS MAJESTY THE KING, Sandringham, for Dinah 2017, born in 1907, calved May 14, 1916

1287 II. (£5.)—LIEUT COL RT HON B BATHURST, M.P. Polebrook Haver Kent, for Alpha 2070, born July 14 1910, calved June 11, 1916; s Dick 2nd 420, d Hope 2124 by Good Luck 377

1291 R. N.—HON MRS CLAUD PORTMAN, Goldicote, Stratford-on-Avon, for La Mancha Glad Bye.
H. C.—1289 1294 O.—1288, 1290

¹ £10 towards these Prizes were given by the English Kerry and Dexter Cattle Society

² Silver Challenge Cup given by the English Kerry and Dexter Cattle Society for the best Animal in Classes 197-199

³ Challenge Trophy given by the English Kerry and Dexter Cattle Society for the best Kerry Bull in Class 197 whose dam has won a prize or commendation in the Milk or Butter Tests at either of the Shows of the B.A.S.E., Bath and West, Royal Counties, Tring, and London Dairy Show

⁴ £10 towards these Prizes were given by the English Kerry and Dexter Cattle Society.

⁵ Challenge Cup given by the English Kerry and Dexter Cattle Society for the best Animal in Classes 200-202

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 202.—*Dexter Heifers, calved in 1914 or 1915.* [9 entries.]

- 1297 I. (£10).—H. M. GIBBS, Barrow Court, Flax Bourton, Bristol, for Barrow Buttercup 6th, born April 19, 1914; s. Barrow Bacchus 419, d. Barrow Buttercup 2nd 1728 by Barrow Count 833.
 1301 II. (£5).—HON. MRS. CLAUD PORTMAN, Goldicote, Stratford-on-Avon, for Norah 2278, born in 1914.
 1303 III. (£3).—R. TAIT ROBERTSON, The Hutch, Malahide, Co. Dublin, for La Mancha Eva, born Feb. 17, 1914; s. La Mancha Paddy (528), d. Gort Sarah 6th (2458) by Gort Toney (548).
 1298 R. N.—H. M. GIBBS, for Barrow Bracelet 4th.
 H. G.—1298, 1299. O.—1302.

Milk Yield Prizes.

Class 203.—*Shorthorn Cows or Heifers.* [35 entries.]

- 706 I. (£10).—G. B. NELSON & SONS, for Proud Strawberry. (See Class 107.)
 703 II. (£5).—ROBERT L. MOND, for Johnny Ross 10th. (See Class 107.)
 689 III. (£3).—G. KELSEY BURGE, for Lady Thrush 3rd. (See Class 107.)
 H. G.—700, 701, 707, 708, 714, 715, 718, 724, 735, 736.

Class 204.—*Lincolnshire Red Shorthorn Cows or Heifers.* [10 entries.]

- 693 I. (£10).—STANLEY BLONDELL, Bendish House, Welwyn, Herts, for Bendish Dorothy 1st 13, p. 236, born Feb. 20, 1911, calved April 8, 1916; s. Gimson Boy 4772.
 694 II. (£5).—JOHN EVANS, for Sherwood No. 24. (See Class 118.)
 695 III. (£3).—JOHN EVANS, for Burton Fillip 2nd. (See Class 118.)
 H. G.—794, 795.

Class 205.—*Devon Cows or Heifers.* [8 entries.]

- 696 I. (£10).—JOHN H. CHICK, for Wynford-Wynford. (See Class 133.)
 697 II. (£5).—R. A. CLARKE, Manor Farm, Chiselborough, Stoke-on-Ham, for Cherry 1st 23346, born Jan. 5, 1909, calved May 12, 1916; s. Durston Taleteller 5764, d. Cherry by Morning Star 4639.
 698 III. (£3).—LOHAM BROS., Aylesbeare, near Exeter, for Orange A 316, born in 1907, calved March 25, 1916.

Class 206.—*South Devon Cows or Heifers.* [3 entries.]

- 616 I. (£10).—PAGE & WHITLEY, for Hilda 3rd. (See Class 138.)
 618 II. (£5).—W. & H. WHITLEY, Primley Farm, Paigaton, for Pippin 9942, born Nov. 23, 1910, calved June 9, 1916, bred by J. Stranger Ford, The Manor House, Weston, Honiton; s. Tregross 2521, d. Butterfly 3rd 6762 by Goodfellow 1881.
 617 III. (£3).—PAGE & WHITLEY, for Milkmaid 8543, born July 10, 1905, calved June 1, 1916, bred by W. S. Harris, Well Farm, Stoke Gabriel, Devon; s. Hero 2nd 1660, d. Pretty 2nd 4127 by Widland Revelstoke 945.

Class 207.—*Longhorn Cows or Heifers.* [1 entry.]

- 989 I. (£10).—W. HANSON SALE, for Arden Lady Panza. (See Class 142.)

Class 208.—*Red Poll Cows or Heifers.* [4 entries.]

- 996 I. (£10).—KENNETH M. CLARK, Sudbourne Hall, Orford, Suffolk, for Sudbourne Russett Belle 2nd 21926, born Aug. 16, 1908, calved March 11, 1916; s. Sudbourne Spicey 9751, d. Sudbourne Russett Belle 20125 by Sudbourne Russett 9500.
 994 II. (£5).—KENNETH M. CLARK, for Sudbourne Ketch 22842, born Sept. 13, 1910, calved April 18, 1916; s. Aspoll Professor 9902, d. Sudbourne Pride of Kettleburgh 4th 21919 by Sudbourne Birdar 9871.

Class 209.—*Ayrshire Cows or Heifers.* [2 entries.]

- 1086 I. (£10).—WILLIAM GIBSON, Moorside Farm, Worston, Clitheroe, for Auchincloigh Kate 2nd 28379, white and brown, born March 13, 1910, calved June 5, 1916, bred by William Bone, Auchincloigh, Galston; s. Auchincloigh General 7592, d. Auchincloigh Kate by Surprise of Gateside 4276.
 1089 II. (£5).—ALEX. CROSS, for Knockdon Diana. (See Class 175a.)

Class 210.—*Holstein-Friesian Cows or Heifers.* [5 entries.]

- 1110 I. (£10).—A. & J. BROWN, for Park Buttercup. (See Class 177.)
 1112 II. (£5).—ERICHARD FORD, Garton, Driffield, for Lake Flower 7768, born Feb. 1, 1912, calved May 17, 1916, bred by John Humble, High Lake, Beverley; s. Park Beauty 1366, d. Lake Abundance 125.
 1114 III. (£3).—MAJOR G. E. POWELL, for Gairloch, Kild. (See Class 177.)

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor"]

Class 211.—*Jersey Cows or Heifers.* [20 entries]

- 1179 I. (£10.)—J H SMITH BARRY for Marionette. (See Class 185)
 1186 II. (£5.)—GROSVENOR BERRY Bromleyhall Standon Herits for Nimrod's Dinah (vol 23 p 378), whole colour born in July 1908 calved Feb 14 1916, s Nimrod 9709 d Chaldee in Dinah by Chaldee 8459
 1186 III. (£3.)—LADY WERNHER Luton Hoo Luton for Carlshad (vol 22, p 367), whole colour born Dec 4 1907 calved March 19 1916 bred by Sir Julius Wernher Bt., s King Henry 8771 d Outnow by Bismarck's Boy 6786
 H. C.—1167 1170 1171 1174 1175

Class 212.—*Guernsey Cows or Heifers.* [11 entries]

- 1240 I. (£10.)—J F REMNANT M.P. for Donnington Jane. (See Class 193)
 1242 II. (£5.)—J F REMNANT M.P. for Orchid 2nd of Blunham 9115 fawn and white born Aug 8 1911 calved Feb 27 1916, bred by O R S Payne Blunham House, Sandy s Merton Signet 5th 2172, d Orchid of Blunham 7401 by Merton Quality 1543
 1286 III. (£3.)—A W BAILEY HAWKINS for Stagenhoe Rose of Gold 1st. (See Class 193)
 H. C.—1248

Class 213.—*Kerry Cows or Heifers.* [4 entries]

- 1274 I. (£10.)—S J BROWN Ard Caem, Naas Co Kildare, for Gort Dainty 3rd 1579, born March 8 1908 calved May 9 1916 bred by David M. Rattray, Gortneskehy Ballybunion Co Kerry, s Gort Earl (597), d Gort Dainty (3310)
 1277 II. (£5.)—MAJOR E ROYDS M.P. for Caythorpe Jewel. (See Class 198)

Class 214.—*Devon Cows or Heifers.* [3 entries.]

- 1285 I. (£10.)—HIS MAJESTY THE KING for Dinah. (See Class 201)
 1286 II. (£5.)—HIS MAJESTY THE KING for Dusky 2018 born in 1910, calved May 19, 1916

Butter Tests.

Class 215.—*Shorthorn Cows*¹ [38 entries]

- 706 I. (£10.)—G B NELSON & SONS for Proud Strawberry. (See Class 107)
 718 II. (£5.)—CAPT A S WILLS Thornby Hill Northampton, for Duchess of Cranford 3rd (vol 56, p 1184) red, born Oct 29 1908 calved May 29 1916 bred by George Taylor Cranford Hounslow, s Beau Sabreur 74049, d Duchess of Armathwaite 4th by Golden Robin 68718
 708 III. (£3.)—HERBERT H OWFRAM, for Wallflower 5th. (See Class 107)
 H. C.—700 707, 714 715, 735 736

Class 216a.—*Cows exceeding 900 lb. live weight.*²

- 706 I. (£15.)—G B NELSON & SONS for Proud Strawberry (See Class 107)
 1186 II. (£10. & B. M.³)—LADY WERNHER for Carlshad (See Class 211)
 805 III. (£5.)—JOHN EVENS for Burton Fillpail 2nd. (See Class 118)
 H. C.—916, 917, 918, 1086, 1112, 1236

Class 216b.—*Cows not exceeding 900 lb. live weight*

- 1179 I. (£15. & G. M.⁴)—J H SMITH-BARRY, for Marionette. (See Class 185)
 1186 II. (£10. & S. M.⁴)—GROSVENOR BERRY, for Nimrod's Dinah. (See Class 211)
 1193 III. (£5.)—J H SMITH-BARRY for Prestige, fawn born March 12, calved Feb 8, 1916, s Radruth 10407 d Promise (vol 20 p 408) by Oxford Sunbeam 8650

Certificates of Merit, 4—1167, 1174

SHEEP.

Oxford Downs.

Class 217.—*Oxford Down Shearling Rams.* [12 entries]

- 1312 I. (£10.) & 1314 R. N.—HUGH W STELGOE The Grounds, Adderbury, near Banbury
 1305 II. (£5.) & 1304 III. (£3.)—ALBERT BRASSEY, Heythrop Park, Chipping Norton.
 H. C.—1306, 1308 1309

¹ Prizes given by the Dairy Shorthorn Association

² Prizes given by the English Jersey Cattle Society.

³ Gold Medal, Silver Medal, and Bronze Medal given by the English Jersey Cattle Society for the three Jersey animals obtaining the greatest number of points in the Butter Tests

⁴ Certificates of Merit given by the English Jersey Cattle Society for Jersey Cows entered in or eligible for entry in the English Jersey Herd Book, not being Prize Winners in the Tests, obtaining the following points—Cows under five years old obtaining 30 points, Cows five years old and upwards obtaining 35 points.

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 218.—*Oxford Down Ram Lambs.*¹ [10 entries.]

- 1320 I. (£10).—ROBERT W. HOBBS & SONS, Kelmscott, Lechlade.
 1322 II. (£5). & 1323 E. N.—FREDERICK PENSON, Taston, Charlbury, Oxon.
 1321 III. (£3).—G. F. MOORE, Chardwar, Bourton-on-the-Water.
 H. C.—1317, 1310, 1324.

Class 219.—*Three Oxford Down Ram Lambs.* [7 entries.]

- 1329 I. (£10). & 1330 E. N.—ROBERT W. HOBBS & SONS, Kelmscott, Lechlade.
 1326 II. (£5).—HENRY AKERS & CO., Moat House, Black Bourton, Clansfield, S O, Oxon.
 1328 III. (£3).—JAMES T. HOBBS, Mansey Hampton, Fairford, Glos.
 H. C.—1332. C.—1327, 1331.

Class 220.—*Three Oxford Down Shearling Ewes.* [3 entries.]

- 1333 I. (£10).—ALBERT BRASSEY, Heythrop Park, Chipping Norton.
 1335 II. (£5).—FREDERICK PENSON, Taston, Charlbury, Oxon.
 1334 III. (£3).—MISS ALICE DE ROTHSCHILD, Waddesdon Manor, Aylesbury.

Class 221.—*Three Oxford Down Ewe Lambs.* [6 entries.]

- 1338 I. (£10).—JAMES T. HOBBS, Mansey Hampton, Fairford, Glos.
 1336 II. (£5).—HENRY AKERS & CO., Moat House, Black Bourton, Clansfield, S O, Oxon.
 1340 III. (£3).—G. F. MOORE, Chardwar, Bourton-on-the-Water.
 1341 E. N.—HUGH W. STILGOE, The Grounds, Adderbury, near Banbury.
 H. C.—1339. C.—1337.

Shropshires.²

Class 222.—*Shropshire Two-Shear Rams.* [3 entries.]

- 1342 I. (£10).—A. S. BERRY, Shenstone Hall, Lichfield.
 1344 II. (£5).—FRANK BIBBY, Hardwicks Grange, Shrewsbury.
 1347 III. (£3).—MISS MARGARET E. INGE, Thorpe Hall, Tamworth, for Thorpe Cranberry, bred by Mrs. W. F. Inge, Thorpe
 1348 E. N.—KENNETH W. MILNES, Stanway Manor, Church Stretton.
 H. C.—1349. C.—1346.

Class 223.—*Shropshire Shearling Rams.* [16 entries.]

- 1364 I. (£10).—E. CRAIG TANNER, Shrawardine, Shrewsbury.
 1360 II. (£5). & 1351 E. N.—A. S. BERRY, Shenstone Hall, Lichfield.
 1359 III. (£3).—C. W. KELLOCK, Highfields, Audlem, Cheshire.
 1358 IV. (£2).—RICHARD E. BIRCH, Maes Elwy, St. Asaph, for ram bred by J. J. Brewin, Brynhyfryd, Babel, Holywell.
 H. C.—1358, 1365. C.—1357.

Class 224.—*Five Shropshire Shearling Rams.* [8 entries.]

- 1366 I. (£15).—A. S. BERRY, Shenstone Hall, Lichfield.
 1370 II. (£10).—C. W. KELLOCK, Highfields, Audlem, Cheshire.
 1373 III. (£5).—T. S. MINTON, Montford, Shrewsbury.
 1371 E. N.—KENNETH W. MILNES, Stanway Manor, Church Stretton.
 H. C.—1368, 1369. C.—1367, 1373.

Class 225.—*Three Shropshire Ram Lambs.* [4 entries.]

- 1381 I. (£10).—THE DUKE OF WESTMINSTER, Eaton, Chester.
 1375 II. (£5).—CHARLES L. COXON, Webton Court, Madley, Hereford.
 1379 III. (£3).—E. & F. NOCK, Harrington Hall, Shifnal, Salop.
 1374 E. N.—R. E. BIRCH, Maes Elwy, St. Asaph.
 H. C.—1374, 1378, 1380. C.—1376.

Class 226.—*Three Shropshire Shearling Ewes.* [9 entries.]

- 1387 I. (£10).—KENNETH W. MILNES, Stanway Manor, Church Stretton.
 1390 II. (£5).—E. CRAIG TANNER, Shrawardine, Shrewsbury.
 1385 III. (£3).—MISS MARGARET E. INGE, Thorpe Hall, Tamworth, for ewes bred by Mrs. W. F. Inge, Thorpe.
 1389 E. N.—T. S. MINTON, Montford, Shrewsbury.
 H. C.—1382, 1383, 1386, 1388.

Class 227.—*Three Shropshire Ewe Lambs.* [6 entries.]

- 1395 I. (£10).—E. CRAIG TANNER, Shrawardine, Shrewsbury.
 1394 II. (£5).—THE DUKE OF WESTMINSTER, Eaton, Chester.
 1394 III. (£3).—E. & F. NOCK, Harrington Hall, Shifnal, Salop.
 1391 E. N.—R. E. BIRCH, Maes Elwy, St. Asaph.
 H. C.—1394.

¹ Prizes given by the Oxford Down Sheep Breeders' Association.

² £45 towards these Prizes were given by the Shropshire Sheep Breeders' Association.

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[Unless otherwise stated each prize animal named below was bred by exhibitor.]

Southdowns.

Class 228—*Southdown Two Shear Rams*¹ [10 entries]

- 1402 I (£10, & Champion²)—SIR JEREMIAH COLMAN BT Gatton Park Surrey
 1397 II (£5) & 1398 III (£3)—HIS MAJESTY THE KING Sandringham Norfolk
 1401 R N—V M CAZALET Furlawne Tonbridge
 O—1399 1400

Class 229—*Southdown Shearling Rams* [16 entries]

- 1418 I (£10, & R N for Champion²)—MAJOR DERMOT MCCALMONT Newmarket
 1407 II (£5)—HIS MAJESTY THE KING Sandringham Norfolk
 1419 III (£3)—THE DUKE OF RICHMOND AND GORDON KG Goodwood Chichester
 1422 R N—LADY WERNHER Luton Hoo Luton
 H O—1408 1421 O—1417

Class 230—*Three Southdown Shearling Rams*¹ [8 entries]

- 1427 I (£10)—O O MILLEN Adisham Court Canterbury
 1423 II (£5)—HIS MAJESTY THE KING Sandringham Norfolk
 1426 III (£3)—MAJOR DERMOT MCCALMONT Newmarket
 1425 R N—SIR JEREMIAH COLMAN BT Gatton Park Surrey
 H O—1420 O—1428

Class 231—*Three Southdown Ram Lambs* [11 entries]

- 1438 I (£10)—MAJOR DERMOT MCCALMONT Newmarket
 1431 II (£5)—HIS MAJESTY THE KING Sandringham Norfolk
 1436 III (£3)—THE EARL OF DERBY, KG Hatchfield Farm Newmarket
 1441 IV (£2)—LADY WERNHER Luton Hoo Luton
 1434 R N—SIR JEREMIAH COLMAN BT Gatton Park, Surrey
 H O—1439

Class 232—*Three Southdown Shearling Ewes* [9 entries]

- 1442 I (£10 & Champion²), & 1443 II (£5, & R N for Champion²)—HIS MAJESTY THE KING Sandringham Norfolk
 1446 III (£3)—SIR JEREMIAH COLMAN BT Gatton Park Surrey
 1449 R N—LADY WERNHER Luton Hoo Luton
 H O—1447

Class 233—*Three Southdown Ewe Lambs* [10 entries]

- 1453 I (£10)—SIR JEREMIAH COLMAN BT Gatton Park Surrey
 1456 II (£5)—MAJOR DERMOT MCCALMONT Newmarket
 1450 III (£3)—HIS MAJESTY THE KING Sandringham Norfolk
 1455 R N—THE EARL OF DERBY KG Hatchfield Farm Newmarket
 H O—1457 O—1458

Hampshire Downs.

Class 234—*Hampshire Down Two-Shear Rams*⁴ [8 entries]

- 1462 I (£10)—JAMES H ISMAY Iwerne Minster House Blandford for Iwerne Froho
 E 909, bred by G C Waters Burcombe Manor Salisbury
 1460 II (£5)—ALFRED E BLACKWELL, The Home Farm, Chipperfield, Kings
 Langley, for Bashful E 818
 1464 R N—MAJOR J A MORRISON Basildon Park, Reading for Flower Dean
 H O—1463 O—1461 1465

Class 235—*Hampshire Down Shearling Rams* [9 entries]

- 1469 I (£10)—JAMES H ISMAY, Iwerne Minster House, Blandford for Iwerne Basildon
 E 785
 1473 II (£5)—MAJOR J A MORRISON Basildon Park Reading for Basildon Flower
 Dean No 6 F 449 D
 1466 III (£3)—ALFRED E BLACKWELL, The Home Farm, Chipperfield Kings
 Langley for Bashful Boy.
 1468 R N—ALFRED E BLACKWELL for Bulwark.
 H O—1471, 1474 O—1467 1472

¹ Prizes given by the Southdown Sheep Society

² Champion Gold Medal given by the Southdown Sheep Society for the best Ram in Classes 228 and 229

³ Silver Medal given by the Southdown Sheep Society for the best Pen of Ewes or Ewe Lambs in Classes 232 and 233

⁴ Prizes given by the Hampshire Down Sheep Breeders Association.

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[Unless otherwise stated, each prize animal named below was bred by exhibitor.]

- Class 236.—Hampshire Down Ram Lambs.** [12 entries]
 1483 I. (£10).—MAJOR J A MORRISON, Basildon Park, Reading
 1481 II. (£5).—MRS JERVOISE, Herriard Park, Basingstoke
 1475 III. (£4).—ALFRED E BLACKWELL, The Home Farm, Chippenfield, Kings Langley
 1477 IV. (£2).—SIR GEORGE A COOPER, Bt, Hursley Park, Winchester
 H. G.—1478, 1479, 1483 O.—1476, 1481, 1485, 1486

- Class 237.—Three Hampshire Down Ram Lambs.** [5 entries]
 1487 I. (£10, & Champion.*)—ALFRED E BLACKWELL, The Home Farm, Chippenfield, Kings Langley
 1491 II. (£5).—MRS JERVOISE, Herriard Park, Basingstoke
 1482 III. (£3).—MAJOR J A MORRISON, Basildon Park, Reading
 1490 R. N.—JAMES H ISMAI, Iwerne Minster House, Blandford
 H. G.—1488, 1494

- Class 238.—Three Hampshire Down Shearling Ewes.** [1 entry]
 1495 II. (£5).—WILLIAM TODD, Valley Farm, Little Ponton, Grantham

- Class 239.—Three Hampshire Down Ewe Lambs.** [7 entries]
 1496 I. (£10, & R. N. for Champion.*)—ALFRED E BLACKWELL, The Home Farm, Chippenfield, Kings Langley
 1499 II. (£5).—MRS JERVOISE, Herriard Park, Basingstoke
 1500 III. (£3).—MAJOR J A MORRISON, Basildon Park, Reading
 1502 R. N.—THE LORD WANDSWORTH INSTITUTION, Long Sutton, Winchfield
 H. G.—1501

Suffolks.

- Class 240.—Suffolk Two-Shear Rams.** [2 entries]
 1503 I. (£10), & 1504 II. (£5).—HERBERT E SMITH, The Grange, Walton, Felixstowe

- Class 241.—Suffolk Shearling Rams.** [3 entries]
 1506 I. (£10), & 1507 II. (£5).—HERBERT E SMITH, The Grange, Walton, Felixstowe
 1505 III. (£3).—CHIVERS & SONS LTD, Histon, Cambs

- Class 242.—Suffolk Ram Lambs.** [6 entries]
 1512 I. (£10), & 1513 II. (£5).—HERBERT E SMITH, The Grange, Walton, Felixstowe
 1510 III. (£3).—W F PAUL, Kirton Lodge, Ipswich
 1508 R. N.—CHIVERS & SONS, LTD, Histon, Cambs
 H. G.—1509 O.—1511

- Class 243.—Three Suffolk Ram Lambs.** [4 entries]
 1517 I. (£10).—HERBERT E SMITH, The Grange, Walton, Felixstowe
 1516 II. (£5).—W F PAUL, Kirton Lodge, near Ipswich
 1514 III. (£3).—CHIVERS & SONS, LTD, Histon, Cambs
 1515 R. N.—GEORGE A GOODCHILD, Great Yeldham, Essex

- Class 244.—Three Suffolk Shearling Ewes.** [4 entries]
 1521 I. (£10), & 1520 II. (£5).—W F PAUL, Kirton Lodge, Ipswich
 1518 III. (£3), & 1519 R. N.—CHIVERS & SONS, LTD, Histon, Cambs

- Class 245.—Three Suffolk Ewe Lambs.** [4 entries]
 1526 I. (£10).—HERBERT E SMITH, The Grange, Walton, Felixstowe
 1524 II. (£5).—W F PAUL, Kirton, Ipswich
 1523 III. (£3).—CHIVERS & SONS, LTD, Histon, Cambs
 1525 R. N.—GEORGE A GOODCHILD, Great Yeldham, Essex

Dorset Downs.*

- Class 246.—Dorset Down Shearling Rams.** [5 entries]
 1530 I. (£10).—RANDOLPH TORY, Charlsworth Manor, Blandford
 1527 II. (£5).—EDEN & WATSON, Milborne Wick, Milborne Port, Somerset
 1528 R. N.—SIR EVERARD HAMBERO, K OVO, Milton Abbey, Blandford

- Class 247.—Three Dorset Down Ram Lambs.** [6 entries]
 1535 I. (£10), & 1536 R. N.—RANDOLPH TORY, Charlsworth Manor, Blandford
 1531 II. (£5).—EDEN & WATSON, Milborne Wick, Milborne Port, Somerset

* Prizes given by the Hampshire Down Sheep Breeders' Association
 † Champion Prize of £10 given by the Hampshire Down Sheep Breeders' Association for the best Ram Lamb, Pen of Ram Lambs or Ewe Lambs in Classes 236, 237, and 239.
 ‡ Prizes given by the Suffolk Sheep Society
 § £15 towards these Prizes were given by the Dorset Down Sheep Breeders' Association

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[Unless otherwise stated each prize animal named below was "bred by exhibitor"]

Class 248.—*Three Dorset Down Shearling Ewes.* [4 entries]

- 1540 I. (£10).—RANDOLPH TOBY, Charlworth Manor, Blandford
 1537 II. (£5).—EDEN & WATSON Milborne Wick, Milborne Port, Somerset
 1538 R. N.—SIR EVERARD HAMBO K O V O, Milton Abbey, Blandford

Dorset Horns.¹

Class 249.—*Dorset Horn Shearling Rams, dropped after November 1, 1914.* [3 entries]

- 1541 I. (£10).—F B BROWN Kingston Farm, Chillerton, Isle of Wight, for Kingston No. 80-182
 1542 II. (£5), & 1543 III. (£3).—FRANK J MERSON & SON, Farrington, North Petherton, Bridgwater

Class 250.—*Three Dorset Horn Ram Lambs, dropped after November 1, 1915.* [4 entries.]

- 1546 I. (£10).—G A & R A KINGSWELL, Wellow Farm, Yarmouth, Isle of Wight
 1545 II. (£5).—F P BROWN, Kingston Farm, Chillerton, Isle of Wight
 1544 III. (£3).—JAMES ATTRILL, Waytes Court, Brightstone, Isle of Wight
 1547 R. N.—FRANK J MERSON & SON, Farrington, North Petherton, Bridgwater

Class 251.—*Three Dorset Horn Shearling Ewes, dropped after November 1, 1914* [4 entries]

- 1548 I. (£10).—JAMES ATTRILL, Waytes Court, Brightstone, Isle of Wight
 1549 II. (£5).—F P BROWN, Kingston Farm, Chillerton, Isle of Wight
 1550 III. (£3), & 1551 R. N.—FRANK J MERSON & SON, Farrington, North Petherton, Bridgwater

Class 252.—*Three Dorset Horn Ewe Lambs, dropped after November 1, 1915.* [4 entries]

- 1553 I. (£10).—F P BROWN, Kingston Farm, Chillerton, Isle of Wight
 1554 II. (£5).—G A & R A KINGSWELL, Wellow Farm, Yarmouth, Isle of Wight
 1552 III. (£3).—JAMES ATTRILL, Waytes Court, Brightstone, Isle of Wight

Ryelands.²

Class 253.—*Ryeland Rams, Two-Shear and upwards* [4 entries]

- 1559 I. (£10).—DAVID J THOMAS, Talachddu, Brecon, for Talachddu Judge 314, born in 1914
 1558 II. (£5).—MRS REGINALD HERBERT, Olytha Park, Abergavenny, for Olytha Spark 168, born in 1914, bred by H A Christy, Llangoed Castle, Breconshire.
 1556 III. (£3).—HUGH A CHRISTY, Llangoed Castle, Llysuan, R.S.O., Brecon, for Llangoed Boxer 288, born in 1914

Class 254.—*Ryeland Shearling Rams.* [9 entries.]

- 1560 I. (£10).—CECIL CLAUDE JACOBS, De la Bèche, Aldworth, Berks., for Royal Nottingham, bred by D J Thomas, Talachddu, Brecon
 1564 II. (£5).—MRS REGINALD HERBERT, Olytha Park, Abergavenny, for Olytha Gladiator.
 1567 III. (£3).—DAVID J THOMAS, Talachddu, Brecon, for Talachddu Ben.
 1563 R. N.—MRS REGINALD HERBERT, for Olytha General.
 H. O.—1560, 1561, 1562

Class 255.—*Three Ryeland Ram Lambs* [4 entries]

- 1570 I. (£10).—MRS REGINALD HERBERT, Olytha Park, Abergavenny
 1572 II. (£5).—DAVID J THOMAS, Talachddu, Brecon
 1571 III. (£3).—CECIL CLAUDE JACOBS, De la Bèche, Aldworth, Berks
 1569 R. N.—HUGH A CHRISTY, Llangoed Castle, Llysuan, Brecon

Class 256.—*Three Ryeland Shearling Ewes.* [5 entries.]

- 1575 I. (£10), & 1576 II. (£5).—MRS REGINALD HERBERT, Olytha Park, Abergavenny
 1573 III. (£3).—HUGH A CHRISTY, Llangoed Castle, Llysuan, R.S.O., Brecon
 1577 R. N.—CECIL CLAUDE JACOBS, De la Bèche, Aldworth, Berks
 H. O.—1574

¹ £18 towards these Prizes were given by the Dorset Horn Sheep Breeders' Association

² £27 towards these Prizes were given by the Ryeland Flock Book Society.

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 257.—Three Ryeland Ewe Lambs. [4 entries.]

- 1581 I. (£10).—DAVID J THOMAS, Tŷllichddu, Brecon
 1579 II. (£5).—MRS REGINALD HERBERT, Clytha Park, Abergavenny.
 1580 III. (£3).—OSCAR CLAUDE JACOBS, De la Beche, Aldworth, Berks
 1578 R. N.—HUGH A CHRISTY, Llangoed Castle, Llyswn, Brecon.

Kerry Hill (Wales).¹

Class 258.—Kerry Hill (Wales) Rams, Two-Shear and upwards.

[5 entries.]

- 1582 I. (£10).—WILLIAM ALDERSON, Glanmihell, Kerry, Mont, for Pentrenant Jailer
 4000, born in 1914, bred by W. V. Davis, Pentrenant, Church Stoke
 1588 II. (£5).—THE EARL OF POWIS, Powis Castle, Welshpool, for Powysland Pride
 4008, born in 1914
 1585 R. N.—CAPT. J. M. NAYLOR, Leighton Hall, Welshpool, for Leighton Lad.
 H. C.—1584 C.—1583.

Class 259.—Kerry Hill (Wales) Shearling Rams [7 entries]

- 1587 I. (£10), & 1588 R. N.—WILLIAM ALDERSON, Glanmihell, Kerry, Mont.
 1592 II. (£5).—THE EARL OF POWIS, Powis Castle, Welshpool.
 H. C.—1590. C.—1593

Class 260.—Three Kerry Hill (Wales) Shearling Ewes. [5 entries]

- 1594 I. (£10).—LORD HARLEBOH, Brogyntyn, Oswestry.
 1595 II. (£5).—CAPT J. M. NAYLOR, Leighton Hall, Welshpool
 1598 R. N.—THE DUKE OF WESTMINSTER, Eaton, Chester.
 H. C.—1597. C.—1596.

Lincolns²

Class 261.—Lincoln Two-Shear Rams. [8 entries.]

- 1601 I. (£10, & Champion.*)—ROBERT & WILLIAM WRIGHT, Nocton Heath and
 Bracebridge Heath, Lincoln, for Nocton Pommer 14307.
 1600 II. (£5).—JOHN PEARS Mere, Lincoln, for Men Leader 14273.
 1599 III. (£3).—O FEILDEN MOSLEY, Leasingham, Sleaford, Lincs.

Class 262.—Lincoln Shearling Rams. [18 entries.]

- 1618 I (£10, & R. N. for Champion*), & 1617 II. (£5).—ROBERT & WILLIAM WRIGHT
 Nocton Heath and Bracebridge Heath, Lincoln
 1616 III. (£3).—W. H. WATSON, Temple Bruer, Lincoln.
 1611 IV. (£2).—CLIFFORD NICHOLSON, Horkstow Manor, Barton-on-Humber.
 1604 R. N.—J. H. DEAN & SONS, Heath House, Nocton, Lincoln.
 H. C.—1605, 1607.

Class 263.—Five Lincoln Shearling Rams. [11 entries.]

- 1622 I. (£15).—J. H. DEAN & SONS, Heath House, Nocton, Lincoln.
 1620 II. (£10).—W. H. WATSON, Temple Bruer, Lincoln.
 1630 III. (£5).—ROBERT & WILLIAM WRIGHT, Nocton Heath and Bracebridge Heath,
 Lincoln
 1628 IV. (£3).—HERBERT PEARS, Potterhanworth, Lincoln.
 1627 R. N.—CLIFFORD NICHOLSON, Horkstow Manor, Barton-on-Humber.
 H. C.—1624, 1627.

Class 264.—Three Lincoln Ram Lambs. [11 entries.]

- 1633 I. (£10), & 1633 III. (£3)—J. H. DEAN & SONS Heath House, Nocton, Lincoln.
 1638 II. (£5), & 1637 R. N.—CLIFFORD NICHOLSON, Horkstow Manor, Barton-on-
 Humber.
 H. C.—1635, 1640. C.—1634.

Class 265.—Three Lincoln Shearling Ewes. [9 entries]

- 1644 I. (£10), & 1645 R. N.—CHARLES E. HOWARD, Nocton Rise, Lincoln.
 1650 II. (£5).—W. H. WATSON, Temple Bruer, Lincoln
 1642 III. (£3).—ANSELL E. HOLT, Home Farm, Sturton, Brigg, Lincs, for No. 468.

¹ £10 towards these Prizes were given by the Kerry Hill (Wales) Flock Book Society.

² £48 towards these Prizes were given by the Lincoln Long-Wool Sheep Breeders' Association.

* Champion Prize of £5 given by the Lincoln Long-Wool Sheep Breeders' Association for the best Ram in Classes 261 and 262.

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[Unless otherwise stated, each prize animal named below was 'bred by exhibitor']

Class 266.—*Pen of Three Lincoln Ewe Lambs* [8 entries]

- 1855 I. (£10), & 1858 III. (£3).—CLIFFORD NICHOLSON, Horkstow Manor Barton-on-Humber
1857 II. (£5).—W H WATSON Temple Bruer Lincoln
1852 R. N.—ANCHILL B HOLT, Home Farm, Sturton Briggs, Lincs

Leicesters.¹

Class 267.—*Leicester Shearling Rams* [8 entries]

- 1864 I. (£10) & 1866 III. (£3).—E F JORDAN Eastburn, Driffeld
1861 II. (£5).—GEORGE HARRISON Gainford Hall Darlington
1859 R. N.—JOHN CRANSWICK Field House Hunmanby Yorks
H. G.—1885 O.—1882

Class 268.—*Three Leicester Ram Lambs* [2 entries]

- 1887 I. (£10).—JOHN CRANSWICK, Field House, Hunmanby Yorks
1888 II. (£5).—GEORGE HARRISON, Gainford Hall, Darlington

Class 269.—*Three Leicester Shearling Ewes* [2 entries.]

- 1869 I (£10), & 1870 II. (£5).—E F JORDAN, Eastburn, Driffeld

Class 270.—*Three Leicester Ewe Lambs* [2 entries]

- 1871 I (£10).—JOHN CRANSWICK Field House Hunmanby Yorks
1872 II. (£5).—GEORGE HARRISON, Gainford Hall, Darlington

Border Leicesters.²

Class 271.—*Border Leicester Rams, Two-Shear and upwards* [2 entries]

- 1874 I (£10).—R G MURRAY & SON, Spittal, Biggar, for General French 3779, born in 1913 bred by John Kinnaird, Jun, New Mains, Stenton
1873 II. (£5).—F BELL, Mundrum, Northumberland for ram born in 1912, bred by A and J N Smith, Leaton

Class 272.—*Border Leicester Shearling Rams.* [7 entries]

- 1878 I (£10, & R. N. for Champion*), & 1879 R. N.—ANDREW M MONTGOMERY, Nether Hall, Castle Douglas
1880 II. (£5), & 1881 III. (£3).—R G MURRAY & SON, Spittal, Biggar

Class 273.—*Border Leicester Shearling Ewes* [8 entries]

- 1885 I (£10, & Champion.*)—ANDREW M MONTGOMERY, Nether Hall, Castle Douglas.
1889 II. (£5), & 1888 III. (£3).—R G MURRAY & SON Spittal, Biggar

Wensleydales.⁴

Class 274.—*Wensleydale Blue-faced Rams, Two-Shear and upwards* [5 entries]

- 1891 I. (£10).—LORD HENRY BENTINCK, M.P, Underley Hall, Kirkby Lonsdale, for Underley Dreadnought 1888 born in 1913
1890 II. (£5).—LORD HENRY BENTINCK, M.P for Lunesdale Quality 2032, born in 1911
1894 III. (£3).—JOHN A WILLIS, Manor House, Carperby Yorks, for Royal Guard, bred by John M Spensley, West Bolton, Carperby
1893 R. N.—JOHN W GREENSETT Holme-on-Swale, Thirsk, for Holme Fashion.

Class 275.—*Wensleydale Blue-faced Shearling Rams.* [6 entries]

- 1700 I. (£10).—JOHN A WILLIS, Manor House, Carperby, Yorks for ram bred by John M Spensley West Bolton Carperby
1895 II. (£5), & 1898 R. N.—LORD HENRY BENTINCK M.P, Underley Hall, Kirkby Lonsdale
1899 III. (£3).—JOHN A WILLIS for ram bred by Thomas Burton, Sandcliffe House Raskelf
H. G.—1897 O.—1898

¹ £18 towards these Prizes were given by the Leicester Sheep Breeders' Association

² £18 towards these Prizes were given by the Society of Border Leicester Sheep Breeders

³ Perpetual Challenge Cup given by the Society of Border Leicester Sheep Breeders for the best Ram or Ewe in Classes 271-273

⁴ £30 towards these Prizes were given by the Wensleydale Blue-faced Sheep Breeders' Association and Flock Book Society.

c Award of Live Stock Prizes at Manchester, 1916.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 276.—Three Wensleydale Blue-faced Shearling Rams. [1 entries]

1701 I. (£10), & 1702 R. N.—LORD HENRY BENTINCK, M.P., Underley Hall, Kirkby Lonsdale.

1704 II. (£5)—JOHN A. WILLIS, Manor House, Carperby, Yorks.

1703 III. (£3.)—JOHN W. GREENSIT, Holme-on-Swale, Thirsk, Yorks.

Class 277.—Three Wensleydale Blue-faced Shearling Ewes. [4 entries]

1705 I. (£10), & 1706 II. (£5.)—LORD HENRY BENTINCK, M.P., Underley Hall, Kirkby Lonsdale.

1708 III. (£3.)—JOHN A. WILLIS, Manor House, Carperby, Yorks.

1707 R. N.—E. WYATT GIBSON, Hestholm, Leyburn.

Class 278.—Wensleydale Ram, Shearling and upward.¹ [1 entry]

1709 I. (£10.)—JOHN W. GREENSIT, Holme-on-Swale, Thirsk, for ram born in 1915.

Class 279.—Three Wensleydale Shearling Ewes.¹ [1 entry.]

1710 I. (£10.)—JOHN W. GREENSIT, Holme-on-Swale, Thirsk

Lonks.²

Class 280.—Lonk Rams, Shearling and upwards. [1 entries.]

1714 I. (£10.)—SIR JOHN O. S. THURSDY, BT., Ormerod House, Burnley, for Field-Marshal, born in 1913, bred by Richard Parker.

1712 II. (£5.)—EDWARD SMITH, Summerhouse Farm, Cowling, Keighley, for Newhall Pride 300, born in 1914, bred by G. Barcroft, New Hall, Edenfield, Manchester.

1711 III. (£3.)—GEORGE BARCROFT, Bank Lane, Ramsbottom for Shuttleworth Wonder, born in 1915.

Class 281.—Lonk Ram Lambs. [1 entries.]

1715 I. (£10.)—EDWARD SMITH, Summerhouse Farm, Cowling, Keighley, for Summerhouse Ranger.

1716 II. (£5.)—EDWARD SMITH, for Summerhouse Star.

1717 III. (£3.)—RICHARD STUART, Brook Vale, Sowerby, Garstang.

Class 282.—Three Lonk Shearling Ewes. [3 entries]

1724 I. (£10.)—SIR JOHN O. S. THURSDY, BT., Ormerod House, Burnley.

1723 II. (£5), & 1722 III. (£3.)—EDWARD SMITH, Summerhouse Farm, Cowling, Keighley.

Derbyshire Gritstones.

Class 283.—Derbyshire Gritstone Rams, Shearling and upwards.

[3 entries.]

1726 I. (£10.)—RICHARD STUART, Brook Vale, Sowerby, Garstang, for Sowerby King, born in 1915, bred by R. Stuart & Sons

Class 284.—Three Derbyshire Gritstone Shearling Ewes. [2 entries.]

1728 I. (£10), & 1729 II. (£5.)—RICHARD STUART, Brook Vale, Sowerby, Garstang, for ewes bred by R. Stuart & Sons

Kent or Romney Marsh.³

Class 285.—Kent or Romney Marsh Two-Shear Rams. [10 entries.]

1737 I. (£10), 1738 III. (£3), & 1739 R. N.—J. EGERTON QUESTED, The Firs, Cheriton, Kent.

1730 II. (£5.)—H. B. AMOS, Ripton, Ashford, Kent, for H. B. Amos No. 14 of 1914 38040.

H. C.—1731, 1733. O.—1734, 1735.

Class 286.—Kent or Romney Marsh Shearling Rams. [20 entries.]

1749 I. (£10, & Champion.⁴)—L. H. & G. W. FINN, Westwood Court, Faversham.

1757 II. (£5), & 1758 R. N.—J. EGERTON QUESTED, The Firs, Cheriton, Kent.

1754 III. (£3.)—ROBERT L. MOND, Combe Bank, near Sevenoaks, for ram bred by J. Neame, Maonsade, Faversham.

H. C.—1741.

¹ Open only to animals entered or eligible for entry in the Wensleydale Flock Book.

² £15 towards these Prizes were given by the Lonk Sheep Breeders' Association.

³ £48 towards these Prizes were given by the Kent or Romney Marsh Sheep Breeders' Association.

⁴ Champion Prize of £10 10s. given by the Kent or Romney Marsh Sheep Breeders' Association for the best Ram in Classes 285 and 286.

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[Unless otherwise stated each prize animal named below was 'bred by exhibitor']

Class 287.—*Five Kent or Romney Marsh Shearling Rams* [5 entries]

- 1764 I (£15)—J EGERTON QUESTED The Fins Cheriton Kent
 1765 II (£10)—A J HICKMAN Court Lodge Egerton Kent
 1762 III (£5)—L H & G W FINN Westwood Court, Faversham
 1761 R N—G FOSTER CLARK Boughton Mount Mudstone

Class 288.—*Three Kent or Romney Marsh Ram Lambs* [8 entries]

- 1771 I (£10), & 1772 R N—J EGERTON QUESTED The Fins Cheriton Kent
 1765 II (£5)—H B AMOS Ripton Ashford Kent
 1767 III (£3)—L H & G W FINN Westwood Court, Faversham

Class 289.—*Three Kent or Romney Marsh Shearling Ewes* [9 entries]

- 1777 I (£10), & 1778 III (£3)—ROBERT L MOND Combe Bank near Sevenoaks for ewe, bred by J Neame, Maidstone Faversham
 1774 II (£5)—W M CAZALET Fairlawne, Tonbridge
 1776 R N—A J HICKMAN Court Lodge Egerton, Kent
 H O.—1773, 1775, 1780 O.—1781

Class 290.—*Three Kent or Romney Marsh Ewe Lambs* [7 entries]

- 1787 I (£10), & 1788 III (£3)—J EGERTON QUESTED The Fins Cheriton Kent
 1782 II (£5)—H B AMOS Ripton Ashford, Kent
 1786 R N—A J HICKMAN Court Lodge Egerton Kent
 H O.—1784 O.—1783

Cotswolds.¹

Class 291.—*Cotswold Shearling Rams* [4 entries]

- 1790 I (£10), & 1789 II (£5)—W T GARNE & SON, Aldsworth Northleach Glos
 1791 III (£3), & 1792 R N.—WILLIAM HOULTON Broadfield Farm Northleach, Glos

Class 292.—*Three Cotswold Ram Lambs* [4 entries]

- 1793 I (£10), & 1794 II (£5)—W. T. GARNE & SON Aldsworth Northleach, Glos
 1795 III (£3), & 1796 R. N.—MURTON & LONG, The Hall, Pudding Norton Fakenham

Class 293.—*Three Cotswold Shearling Ewes* [4 entries]

- 1797 I (£10), & 1798 II (£5)—W T GARNE & SON Aldsworth Northleach Glos
 1800 III (£3)—MURTON & LONG, The Hall, Pudding Norton Fakenham, Norfolk
 1799 R N.—WILLIAM HOULTON, Broadfield Farm, Northleach Glos

Class 294.—*Three Cotswold Ewe Lambs*. [2 entries]

- 1801 I (£10), & 1802 II (£5)—W T GARNE & SON, Aldsworth Northleach Glos

Devon Long-Wools.

Class 295.—*Devon Long-Wool Rams, Shearling and upwards*

[1 entry]

- 1803 I. (£10)—FREDERICK WHITE, Torweston, Williton, Somerset, for ram, born in 1915

Class 296.—*Three Devon Long-Wool Shearling Ewes* [1 entry]

- 1804 I. (£10)—FREDERICK WHITE, Torweston, Williton, Somerset

South Devons.²

Class 297.—*South Devon Two-Shear Rams*. [2 entries]

- 1805 I. (£10)—JOHN STOOKE Sherford Brixton, Plymouth, for ram bred by H. Fairweather, Malston, Kingsbridge, Devon.

Class 298.—*South Devon Shearling Rams* [6 entries]

- 1811 I. (£10), & 1810 R. N.—W & H WHITLEY, Primley Farm, Paignton
 1808 II. (£5)—JOHN STOOKE, Sherford, Brixton, Plymouth

Class 299.—*Three South Devon Ram Lambs* [2 entries.]

- 1814 I. (£10)—W & H WHITLEY, Primley Farm, Paignton
 1815 II. (£5)—JOHN STOOKE, Sherford, Brixton, Plymouth

Class 300.—*Three South Devon Shearling Ewes* [2 entries]

- 1816 I (£10)—W & H WHITLEY, Primley Farm, Paignton
 1815 II. (£5)—JOHN STOOKE, Sherford, Brixton, Plymouth

¹ £12 towards these Prizes were given by the Cotswold Sheep Society

² £20 towards these Prizes were given by the South Devon Flock Book Association

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 301.—Three South Devon Ewe Lambs. [2 entries.]

- 1818 I. (£10).—W. & H. WHITLEY, Primley Farm, Paignton.
1817 II. (£5).—JOHN STOOKE, Sherford, Brixton, Plymouth.

Dartmoors.¹

Class 302.—Dartmoor Rams, Two-Shear and upwards. [4 entries.]

- 1822 I. (£10).—ROBERT S. LUSCOMBE, Wisdome, Cornwood, Devon, for The Gentle Shepherd 19, born in 1914, bred by H.M. Prison Farm, Dartmoor.
1821 II. (£5).—JOHN R. T. KINGWELL, Great Alah, South Brent, Devon, for Oleave Champion 583, born in 1913, bred by H. Northey, Lake, Lifton, Devon.
1819 R. N.—GEORGE GLANFIELD, West Lake, Okehampton, for Kingswell's Pattern No. 644.

Class 303.—Dartmoor Shearling Rams. [4 entries.]

- 1825 I. (£10).—W. A. JOHNS & SONS, Oleave, Lifton, Devon, for Oleave No. 153 1931.
1823 II. (£5).—GEORGE GLANFIELD, West Lake, Okehampton, Devon, for Tor Park No. 5, bred by R. B. Yelland, Tor Park, Brentor.
1826 R. N.—ROBERT S. LUSCOMBE, Wisdome, Cornwood, Devon.

Class 304.—Three Dartmoor Shearling Ewes. [1 entry.]

- 1827 I. (£10).—GEORGE GLANFIELD, West Lake, Okehampton, Devon.

Exmoor Horns.²

Class 305.—Exmoor Horn Rams, Two-Shear and upwards. [2 entries.]

- 1828 I. (£10).—LORD POLTIMORE, Court Hall, North Molton, North Devon, for Record, born in 1914, bred by J. H. Turner, West Moland, South Molton, Devon.
1829 II. (£5).—LORD POLTIMORE, for Tyres No. 808, born in 1914, bred by R. S. Westcott, Zeal, Hawkrige, Dulverton, Somerset.

Class 306.—Exmoor Shearling Rams. [1 entry.]

[No award.]

Class 307.—Three Exmoor Shearling Ewes. [2 entries.]

- 1832 I. (£10).—LORD POLTIMORE, Court Hall, North Molton, North Devon, for No. 180.

Cheviots.³

Class 308.—Cheviot Rams, Two-Shear and upwards. [7 entries.]

- 1833 I. (£10, & Champion.*).—JOHN ROBSON, Milkknowe, Duns, for ram, born in 1914.
1832 II. (£5).—JOHN W. ATTCHISON, Linhope, Hawick, for Granshaws 2711, born in 1913, bred by John Robson, Newton, Bellingham.
1837 III. (£3).—JACOB ROBSON, Byrness, Otterburn, for ram, born in 1914.
1834 R. N.—JOHN W. ATTCHISON, for Flashlight 2nd.

Class 309.—Cheviot Shearling Rams. [8 entries.]

- 1846 I. (£10), & 1847 III. (£3).—JOHN ROBSON, Milkknowe, Duns.
1844 II. (£5).—JACOB ROBSON, Byrness, Otterburn.
1841 R. N.—JOHN W. ATTCHISON, Linhope, Hawick.

Class 310.—Cheviot Shearling Ewes. [7 entries.]

- 1849 I. (£10, & R. N. for Champion.*).—W. HOGG, Newlands, Gifford, Edinburgh.
1853 II. (£5).—JOHN ROBSON, Milkknowe, Duns.
1852 III. (£3).—JACOB ROBSON, Byrness, Otterburn.

Herdwicks.⁴

Class 311.—Herdwick Rams, Two-Shear and upwards. [6 entries.]

- 1857 I. (£10).—S. D. STANLEY-DODGSON, Tarnbank, Cockermouth, for Blue Blood, born in 1912, bred by John Bathery, Wasdale Head Hall, Gosforth, Cumberland.
1856 II. (£5).—THE EARL OF LONSDALE, Whitehaven Castle Estate, for ram, born in 1912, bred by William Abbott, Mockerkiln, Cockermouth.
1860 R. N.—CHRISTOPHER G. WILSON, Kentmere Hall, Kendal, for Champion.
R. O.—1858. O.—1859.

¹ £15 towards these Prizes were given by the Dartmoor Sheep Breeders' Association.

² £15 towards these Prizes were given by the Exmoor Horn Sheep Breeders' Society.

³ £15 towards these Prizes were given by Breeders of Cheviot Sheep.

* The "Borthwick" Challenge Cup, given by the Cheviot Sheep Society for the best ram or ewe in Classes 308-310.

⁴ £15 towards these Prizes were given by Breeders of Herdwick Sheep.

Award of Live Stock Prizes at Manchester, 1916. ciii

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 312.—*Hardwick Shearling Rams* [3 entries.]

- 1862 I. (£10.)—S D STANLEY-DODGSON, Tarnbank, Cockermouth, for Blackston, bred by J. D Barwise, Blackston, Cleator Cumberland.
1863 II. (£5.)—D. STANLEY-DODGSON, for Jonathan.
1861 R. N.—THE EARL OF LONSDALE, Whitehaven Castle Estate.

Class 313.—*Three Hardwick Shearling Ewes.* [3 entries.]

- 1866 I. (£10.)—S D STANLEY-DODGSON, Tarnbank, Cockermouth.
1865 II. (£5.), & 1864 R. N.—THE EARL OF LONSDALE Whitehaven Castle Estate.

Welsh Mountain.¹

Class 314.—*Welsh Mountain Rams, Two-Shear and upwards.* [9 entries.]

- 1874 I. (£10.)—THE UNIVERSITY COLLEGE OF NORTH WALES, College Farm, Aber, Bangor, for ram, born in 1914
1871 II. (£5.)—WILLIAM GEORGE ROBERTS Dyserth Hall, Dyserth, for Madryn Gwyllyn G1 born in 1914, bred by the late Col Platt Madryn
1873 III. (£3.)—THE UNIVERSITY COLLEGE OF NORTH WALES, for Snowdon F 8 704, born in 1913
1867 R. N.—JOSEPH LLEWELYN GRATTON, Och'r Gop Farm, Newmarket, Dyserth, Flints, for Breckon Boy.
H. C.—1873. G.—1868

Class 315.—*Welsh Mountain Shearling Rams.* [8 entries.]

- 1882 I. (£10.)—THE UNIVERSITY COLLEGE OF NORTH WALES, College Farm, Aber, Bangor, for Snowdon H1.
1883 II. (£5.)—THE UNIVERSITY COLLEGE OF NORTH WALES, for Snowdon H 3.
1879 R. N.—MAJOR ERIC J. W. PLATT, Gordinog, Llanfairfechan
H. C.—1881

Class 316.—*Welsh Mountain Ram Lambs.* [7 entries.]

- 1889 I. (£10.)—THE UNIVERSITY COLLEGE OF NORTH WALES, College Farm, Aber, Bangor.
1888 II. (£5.)—WILLIAM GEORGE ROBERTS Dyserth Hall, Dyserth.
1887 R. N.—MAJOR ERIC J W PLATT, Gordinog, Llanfairfechan
H. C.—1890 G.—1884 1886

Class 317.—*Three Welsh Mountain Shearling Ewes.* [6 entries.]

- 1896 I. (£10.)—THE UNIVERSITY COLLEGE OF NORTH WALES, College Farm, Aber, Bangor
1894 II. (£5.)—WILLIAM GEORGE ROBERTS, Dyserth Hall, Dyserth.
1891 R. N.—JOSEPH LLEWELYN GRATTON, Och'r Gop Farm, Newmarket, Dyserth.
H. C.—1893, 1895. G.—1892

Black-faced Mountain.

Class 318.—*Black-faced Mountain Rams, Shearling and upwards.* [8 entries.]

- 1898 I. (£10.)—WALTER N. COCHRANE, St. John's Chapel, co Durham, for ram, born in 1914, bred by John Robson, Newton Bellingham, Northumberland
1897 II. (£5.)—WALTER N. COCHRANE, for ram, born in 1915.
1900 R. N.—JOHN ROBSON, Newton, Bellingham, Northumberland.
G.—1899.

Class 319.—*Black-faced Mountain Shearling Ewes* [6 entries.]

- 1903 I. (£10.)—JOHN ROBSON, Newton, Bellingham, Northumberland.
1905 II. (£5.)—WALTER N COCHRANE St. John's Chapel, co. Durham
1907 R. N.—OCTAVIUS MONKHOUSE, Cowhill, Wearhead, for Duchess of Manchester.
G.—1906.

GOATS.²

Class 320.—*Male Goats, any variety, over 2 years old.* [9 entries.]

- 1919 I. (£3.)—MRS. C. L. FIOKARD, Edenbreck, Lancaster, for Edenbreck Midas 740 K.R. 8796, Anglo Nubian, born Jan 6, 1914; s Forest Buffoon 589, d. Coxhill Minerva 524 by Markhouse Apollo S.G.R. 223

¹ £17 towards these Prizes were given by the Welsh Mountain Sheep Flock Book Society.

² £22 towards these Prizes were given by the Manchester Local Committee, and £23 by the British Goat Society

civ *Award of Live Stock Prizes at Manchester, 1916.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 1917 II. (£2).—REGINALD PEASE, Sledwick, Barnard Castle, for Sadberge Berserker 678 Anglo-Nubian, born April 20, 1913; s Sadgemere Viking 576, d Sadberge Sparrow 327 by Bricket Llewellyn 112.
 1918 III. (£1).—HERBERT E. HUGHES, "Goats," Broxbourne, Herts, for Broxbourne White Nugget 1499, Saanen, born March 18, 1911; s Broxbourne Adveral 1917, d Broxbourne Venu 1259 by Swanen King (imported).
 1915 E. N.—MRS. LACY-HULBERT, Mayfield, Cheam, Surrey, for Mayfield Tipperary. G.—1912

Class 321.—Male Goats, any variety, above 1 year, and not exceeding 2 years old. [8 entries.]

- 1920 I. (£3).—SIR H. F. DE TRAFFORD BT, Hill Crest, Market Harborough, for Harborough Volunteer 834, Anglo-Nubian, born Aug. 7, 1914; s Sadberge Berserker 678, d Sadberge Scrup 603 by Corthill Nonnense 525.
 1921 II. (£2).—HERBERT E. HUGHES, "Goats," Broxbourne, Herts, for Broxbourne Limit 2490, Saanen, born June 17, 1915; s Broxbourne White Nugget 1999, d Broxbourne Fairy Queen

Class 322.—Male Kids, any variety, not exceeding 1 year old. [10 entries.]

- 1932 I. (£3).—MISS POPE, Bashley Lodge, New Milton, Hants, for Prime 2553 K.R. 4587, Swiss-Saanen-Nubian, born Feb. 22, 1916; s Sedgemere François, d Prejudice 2500 by Champion Leazes Luck 1754.
 1930 II. (£2).—MISS POPE, for Performer 2252 K.R. 4563, Swiss-Saanen-Nubian, born Feb. 24, 1916; s Sedgemere François, d Prejudice 2500 by Champion Leazes Luck 1754.
 1939 III. (£1).—MRS. REGINALD PEASE, Sledwick, Barnard Castle, for Sadberge Tiberius 890 K.R. 4601, Anglo-Nubian, born Feb. 5, 1916; s Sadberge Caesar 744, d Sadberge Ousel 755 by Sledwick Redmond 664.
 1938 E. N.—MRS. REGINALD PEASE, for Sadberge Caligula. H. O.—1924 G.—1925, 1931

Class 323.—Female Goats, Swiss or Anglo-Swiss, over 2 years old. [6 entries.]

- 1934 I. (£3).—HERBERT E. HUGHES, "Goats," Broxbourne, Herts, for Broxbourne March Maiden 2448, Saanen, born March 28, 1911, kidded March 18, 1914; s Broxbourne Adveral 1947, d Broxbourne Malvern 1991 by Broxbourne Adam 1190.
 1937 II. (£2).—MRS. JOHN COPPIN STRAKER, The Leazes, Hexham, for Halton Harebell 1940, Swiss, born Jan. 22, 1912, kidded Feb. 20, 1916, bred by Mrs. Barnett, Halton Castle, Corbridge; s Halton Hermit T. 226, d Halton Heather 1708 by Martin T. 213.
 1938 III. (£1).—MRS. JOHN COPPIN STRAKER, for Halton Hecuba T. 270, Swiss, born March 18, 1912, kidded Feb. 8, 1916, bred by Mrs. Barnett, Halton Castle, Corbridge; s Champion Le Castor T. 200, d Sedgemere Cassandra T. 144 by Sedgemere Paris T. 87.
 1935 E. N.—HERBERT E. HUGHES, for Sedgemere Gruyer.

Class 324.—Female Goats, Anglo-Nubian, entered or eligible for entry in the Anglo-Nubian section of the Herd Book, over 2 years old. [22 entries.]

- 1939 I. (£3).—MRS. O. L. PICKARD, Edenbreck, Lancaster, for Forest Minstrel 591 K.R. 3988, born April 10, 1912, bred by Lady Arthur Cecil, The Mount, Lynton; s Corthill Noodle 618 Q.R. 278, d Addington Myrtle 616 by Barton Blackrock S.G.R. 150 1827.
 1933 II. (£2).—MRS. REGINALD PEASE, Sledwick, Barnard Castle, for Sadberge Sparrow 327, born March 20, 1919, kidded April 22, 1916; s Bricket Llewellyn 112, d Vida 454 by Grey Rock 215.
 1954 III. (£1).—MRS. REGINALD PEASE, for Sadberge Starling 528, born March 20, 1909; s Bricket Llewellyn 112, d Vida 454 by Grey Rock 215.
 1948 E. N.—MRS. REGINALD PEASE, for Sadberge Ousel. H. O.—1930 G.—1956, 1958, 1960.

Class 325.—Female Goats, any other variety, over 2 years old. [10 entries.]

- 1962 I. (£3).—MESDAMES HUNTER & SCAMES, Long Buckby Wharf, Rugby, for Pychley Belle 2361, Anglo-Nubian-Swiss, born May 18, 1913, kidded April 27, 1916; s Champion Leazes Lucky Steyne 281, d Hope.
 1964 II. (£2).—MRS. LACY-HULBERT, Mayfield, Cheam, Surrey, for Withdean Molly 2188 Anglo-Swiss, born May 15, 1913, kidded March 6, 1916, bred by Dr. Clutterbuck, Surrenden Road, Brighton; s Champion Leazes Luck 1754, d Champion Withdean Queen by Sedgemere Princeps.
 1967 III. (£1).—MISS POPE, Bashley Lodge, New Milton, Hants, for Prime 2499, Saanen-Nubian-Swiss, born Feb. 28, 1914, kidded April 10, 1918; s Champion Leazes Luck 1754, d Broxbourne Dorothy 1581 by Adam 1190.
 1966 E. N.—MISS POPE, for Prejudice. H. O.—1961, 1968 G.—1969, 1970.

Award of Live Stock Prizes at Manchester, 1916. ov

[Unless otherwise stated, each prize animal named below was bred by exhibitor.]

Class 326.—Goatlings, Anglo-Nubian, entered or eligible for entry in the Anglo-Nubian section of the Herd Book, above 1 year and not exceeding 2 years old [5 entries]

- 1972 I. (£3)—WILLIAM SMART HORNT Nash Court Westwell Ashford Kent, for Westwell Luck 877 born March 29 1915, s Woodlind Marauder 743 d Woodland Cleopatra 491 by Bricket Cup 82
 1973 II. (£2)—MRS REGINALD PEASE Sledwick Barnard Castle for Sadberge Mavis 815 born March 17 1915 s Sadberge Romulus 738 d Sadberge Phalarope 679 by Sedgemere Viking 536
 1974 III. (£1)—REGINALD PEASE Sledwick Barnard Castle for Sledwick Matilda 814 born March 1 1915 s Sadberge Berserker 678, d Sledwick Greta 663 by Coxhill Noodle 526
 H. O.—1975

Class 327.—Goatlings, Swiss or any other variety above 1 year and not exceeding 2 years old [8 entries]

- 1981 I. (£3)—MISS POPE Bashley Lodge New Milton Hunts for Prude 2501, Saanen-Nubian Swiss born Feb 22 1915 s Champion Leaves Luck 1754 d Broxbourne Dorothy 1581 by Adam 1190
 1977 II. (£2)—MESDAMES HUNTER & SOAMES Long Buckby Wharf Rugby for Pychley Miranda, Anglo-Nubian Swiss born May 23 1915 s Pychley Mayday, d Pychley Merrypen by Champion Leaves Luck, Steyne 294
 1979 III. (£1)—M. I. MITCHELL Grange House Levenshulme for Grange Griselda K.R. 4495 Anglo-Nubian Foggenburg born April 15 1915 s Grange Granite, d Hawthorn Granite 2.56 by Holly Lodge Blue Granite
 1976 B. N.—HARBERI L. PUGHALL Gpats Broxbourne Herts for Broxbourne Curls H. O.—1983 G.—1980

Class 328.—Female Kids, Anglo-Nubian, entered or eligible for entry in the Anglo-Nubian section of the Herd Book not exceeding 1 year old [7 entries]

- 1988 I. (£3)—MRS REGINALD PEASE Sledwick, Barnard Castle, for Sadberge Grouse 853 born Aug 5 1915, s Sadberge Caesar 744 d Sadberge Partridge 699 by Coxhill Noodle 526
 1984 II. (£2)—SIR H. F. DE TRAFORD BT, Hill Crest Market Harborough, for Harborough Daffodil 867, born Sept 30 1915, s Sedgemere Viking 556 d Coxhill Durymaid 522 by Hunt's Curds 1308
 1985 III. (£1)—SIR H. F. DE TRAFORD BT for Harborough Sparrow 881 born Jan 20 1916, s Sedgemere Viking 556 d Sadberge Petrel 657 by Coxhill Noodle 526
 1987 B. N.—MRS REGINALD PEASE for Sadberge Lark.
 H. O. 1988, 1989

Class 329.—Female Kids, Swiss or any other variety, not exceeding 1 year old. [10 entries]

- 1986 I. (£3)—MRS LACY HULBERT, Mayfield, Chesh., Surrey, for Mayfield Mignonette 2801 Anglo-Swiss born March 6 1916, s Mayfield Tipperary 2418 d Withdean Molly 2188 by Champion Leaves Luck 1754
 1990 II. (£2)—MISS POPE Bashley Lodge, New Milton, Hunts, for Progress 2813 Saanen Nubian Swiss born April 10 1916 s Champion Broxbourne White Nugget 1989, d Pride 2499 by Champion Leaves Luck 1754
 1994 III. (£1)—MESDAMES HUNTER & SOAMES Long Buckby Wharf, Rugby, for Pychley Princess, Anglo-Nubian Swiss born Feb 1 1916, s Bricket Majestic, d Peg
 1998 B. N.—JAMES N. PICKARD, Edenbreck, Lancaster for Edenbreck Sylvia.
 G.—1899

Class 330.—Milk Yield Prizes, open to Goats entered in Classes 323 to 325 only. [24 entries]

- 1992 I. (£3)—MESDAMES HUNTER & SOAMES, for Pychley Bella. (See Class 325)
 1999 II. (£2, & Champion)—MRS O. L. PICKARD for Forest Minikin. (See Class 324)
 1994 III. (£1)—MRS LACY HULBERT for Withdean Molly. (See Class 325)
 1990 B. N. for Champion.—THE HON. MRS. POMEROY, for Forest Nonsatiny.

* Silver Challenge Cup given by the British Goat Society for the Anglo-Nubian Goat winning the highest points in the Milk Yield Class

cvi *Award of Live Stock Prizes at Manchester, 1916.*

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

PIGS.

Large Whites.

Class 331.—*Large White Boars, farrowed in 1912, 1913, or 1914.*
[5 entries.]

- 2006 I. (£10).—ALFRED W. WHITE, Illegom, Spalding, for Spalding Vulcan 17703, born Jan. 7, 1913; s Wonder 2nd 15459, d Nottingham Choice Lass 4th 25810 by Fulwood Longfellow 9121.
2002 II. (£5).—SIR GILBERT GREENALL, BT. C.V.O., Walton Hall, Warrington, for Jay of Worsley 14th 16147, born Jan. 6, 1912 bred by D. R. Daybell, Bottesford, Nottingham; s. Mollington Jay of Bottesford 10965, d. Bottesford Empress 6th 20496 by Ruddington Roger of Bottesford 10083.
2008 III. (£3).—SIR GILBERT GREENALL, BT., C.V.O., for Ringleader of Bottesford 17621, born Jan. 3, 1913, bred by P. J. Dean, Tarbock, Prescot, Lancs.; s. Worsley Turk 30th 15535, d. Worsley Duchess 13th 23800 by Worsley Roger 8837.
2004 E. N.—EDMUND WHERRY, Bourne, Lincs., for Bourne Bandmaster 2nd.
C.—2001.

Class 332.—*Large White Boars, farrowed in 1915, before July 1.*¹
[6 entries.]

- 2007 I. (£10, & Champion²).—SIR GILBERT GREENALL, BT., C.V.O., Walton Hall, Warrington, for Worsley Jay 35th 20418, born Jan. 26; s Jay of Worsley 12th 16143, d. Worsley Lady 10th 39629 by Worsley Emperor 35th 15479.
2008 II. (£5).—SIR GILBERT GREENALL, BT., C.V.O., for Worsley Jay 36th 20421, born Jan. 7; s Jay of Worsley 12th 16143, d. Queen of Audlem 39044 by Worsley Emperor 35th 15479.
2010 III. (£3).—EDMUND WHERRY, Bourne, Lincs., for Bourne Bandsman 27th 19789, born Jan. 7, s Bourne Bandsman 2nd 18407, d. Buttercup of Bourne 40758 by Eclipse of Altrincham 13583.
2009 E. N.—R. MITTLINGTON KNOWLES, Colston Bassett Hall, Notts., for General Ruski.
H. C.—2011.

Class 333.—*Large White Boars, farrowed in 1915, on or after July 1.*¹
[7 entries.]

- 2014 I. (£10, & E. N. for Champion²).—SIR GILBERT GREENALL, BT., C.V.O., Walton Hall, Warrington, for Worsley Turk 76th, born July 6; s Worsley Turk 28th 15531, d. Worsley Empress 60th 33648 by Worsley Monarch 25th 11193.
2013 II. (£5).—SIR GILBERT GREENALL, BT., C.V.O., for Bottesford Emperor 10th 19743, born July 2, bred by D. R. Daybell, Bottesford, Nottingham; s. Emperor of Aughton 13583, d. Buttercup of Bottesford 24808 by Radium 11017.
2018 III. (£3).—ALFRED W. WHITE, Illegom, Spalding, for Spalding Turk 7th, born July 19; s. Turk of Rayton 16598, d. Queen Bess 41881 by Stanwardine Jay 16846.
2012 E. N.—DANIEL R. DAYBELL, Bottesford, Nottingham, for Bottesford Ringleader 2nd.
H. C.—2016, 2017.

Class 334.—*Large White Boars, farrowed in 1916.* [19 entries.]

- 2020 I. (£10), 2021 II. (£5), & 2022 E. N.—DANIEL R. DAYBELL, Bottesford, Nottingham, for boar, born Jan. 8; s Ringleader of Bottesford 2nd 17623, d. Bottesford Empress 8th 37822 by Mollington Jay of Bottesford 10965.
2034 III. (£3).—EDMUND WHERRY, Bourne, Lincs., for Bourne Broadside, born Jan. 14; s. Worsley Turk 66th 19261, d. Buttercup of Bourne 40758 by Eclipse of Altrincham 13583.
H. C.—2024, 2025, 2027, 2029, 2036, 2037. C.—2026, 2030, 2031.

Class 335.—*Large White Breeding Sows, farrowed in 1912, 1913, or 1914.*
[9 entries.]

- 2041 I. (£10, & Champion²).—SIR GILBERT GREENALL, BT., C.V.O., Walton Hall, Warrington, for Worsley Lady 7th 36550, born Jan. 10, 1912, farrowed March 24th, bred by the late Earl of Ellesmere, Worsley Hall, Manchester; s Worsley Turk 18th 14328, d Ladylike of Worsley 3rd 26816 by Bouncing Boy of Nottingham 10627.

¹ Prizes given by the National Pig Breeders' Association

² Champion Gold Medal given by the National Pig Breeders' Association for the best Boar in Classes 331-334

³ Champion Gold Medal given by the National Pig Breeders' Association for the best Sow in Classes 335-337.

Award of Live Stock Prizes at Manchester, 1916. cvii

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

- 2045 II. (£5.)—A E TODD, Stoneybank, Musselburgh, for Ramsey Marie 9th 39082, born July 12, 1913, farrowed Jan 25, bred by J I Major, Ramsey, Hunts; s. West Derby Turk 17843, d Ramsey Marie 28580 by Wonder 13017.
- 2040 III. (£3.)—SIR GILBERT GREENALL, BT, C.V.O. for Queen of Audlem 39041, born May 25, 1912, farrowed Jan 26, bred by the late Earl of Ellesmere, Worsley Hall, Manchester; s Worsley Emperor 38th 15479, d. Worsley Marchington Queen 26648 by Worsley Turk 4th 11217.
- 2038 R. N.—CHIVERS & SONS, LTD, Histon, Cambs, for Fen Princess.
H. C.—2046 C.—2039

Class 336.—*Large White Sows, farrowed in 1915, before July 1.*

[12 entries.]

- 2051 I. (£10, & R. N. for Champion.)—SIR GILBERT GREENALL, BT, C.V.O, Walton Hall, Warrington, for Worsley Queen 57th, born Jan. 7; s. Jay of Worsley 12th 16143, d Queen of Audlem 39041 by Worsley Emperor 38th 15479
- 2057 II. (£5.)—EDMUND WHERRY, Bourne, Lincs, for Bourne Bridget 43794, born Jan 3; s Bourne Bandsman 2nd 18407, d Bourne Beatrice 37th 37702 by Wyboston Pioneer 15563
- 2047 III. (£3.)—CHIVERS & SONS, LTD, Histon, Cambs, for Histon North Lass, born March 1, s Weston Volunteer 17855, d North Lass 33750 by Northern Wonder 3rd 13845
- 2058 R. N.—EDMUND WHERRY, for Bourne Duchess 48th.
H. C.—2052, 2054. C.—2049.

Class 337.—*Large White Sows, farrowed in 1915, on or after July 1.*

[11 entries]

- 2060 I. (£10.)—SIR GILBERT GREENALL, BT, C.V.O, Walton Hall, Warrington, for Worsley Empress 115th, born July 8, s Worsley Turk 38th 15581, d Worsley Empress 60th 33648 by Worsley Monarch 25th 11193
- 2068 II. (£5.)—EDMUND WHERRY, Bourne, Lincs, for Bourne Barbara 4th, born July 15; s Bourne 2nd 18463, d Bourne Beatrice 21st 34862 by Bourne Banner 13905.
- 2059 III. (£3.)—DANIEL R. DAYBELL, Bottesford, Nottingham, for Bottesford Buttercup 10th, born July 6; s Ringleader of Bottesford 2nd 17623, d. Bottesford Buttercup 4th 40638 by Mollington Jay of Bottesford 10865
- 2062 R. N.—SIR GILBERT GREENALL, BT, C.V.O, for Worsley Empress 115th.
H. C.—2069. C.—2061.

Class 338.—*Three Large White Sows, farrowed in 1916. [8 entries.]*

- 2070 I. (£10.)—DANIEL R. DAYBELL, Bottesford, Nottingham, for sows, born Jan. 8; s. Choice Lad of Bottesford 18523, d. Bottesford Empress 11th by Ringleader of Bottesford 2nd 17623
- 2076 II. (£5.)—A E TODD, Stoneybank, Musselburgh, Midlothian, for sows born Jan 2, s Bottesford Radiance 15941, d. Matchless Maud 41724 by Ringleader of Bottesford 17623.
- 2071 III. (£3.)—SIR GILBERT GREENALL, BT, C.V.O, Walton Hall, Warrington, for sows, born Jan. 1; s. Worsley Jay 26th 17915, d. Worsley Queen 51st 36646 by Worsley Turk 38th 15531
- 2075 R. N.—JOHN NEAVEYSON, Eye, Peterborough
H. C.—2077. C.—2072, 2074

Middle Whites.

Class 339.—*Middle White Boars, farrowed in 1912, 1913, or 1914.*

[5 entries.]

- 2079 I. (£10, & Champion.)—JOHN CHIVERS, Histon, Cambridge, for Shrewsbury 19511, born Jan. 27, 1914 bred by H. R. Beaton, Hammonds, Checkendon, Reading; s. Walton of Fendley 15711, d. Hammonds' Salonica 36918 by Hammonds' Hardware 15825
- 2080 II. (£5, & R. N. for Champion.)—LEOPOLD C. PAGET, Middlethorpe Hall, York, for Reveller of Wharfedale 18115, born Jan. 6, 1913, bred by the Earl of Sefton, Croxeth Hall, Lancs, s. Blythe Reveller 15575, d. Miss Patie 30850 by Tarbock Clumber 13101.
- 2081 III. (£3.)—LEOPOLD C. PAGET, for Wharfedale Corporal 18589, born March 8, 1914; s. Earl of Wharfedale 18749, d. Halsand Rose 6th 34074 by Holywell Vicar 2nd 11281
- 2078 R. N.—H R. BEERON, Hammonds Farm, Checkendon, Reading, for Halo of Hammonds.

¹ Champion Gold Medal given by the National Pig Breeders' Association for the best Sow in Classes 235-337.

² Champion Gold Medal given by the National Pig Breeders' Association for the best Boar in Classes 339-341.

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 340.—Middle White Boars, farrowed in 1915. [5 entries.]

- 2086 I. (£10).—R. E. W. STEPHENSON, Tue Brook, Liverpool, for David 3rd of Croxteth, born Jan. 26, bred by the Trustees of the Earl of Lathom, Lathom Park, Ormskirk; s. Blythe David 18004, d. Lathom Rose 5th 34133 by Tarbock Prince 12103.
 2083 II. (£5).—JOHN CHIVERS, Histon, Cambs., for Histon Vanguard, born March 9; s. Shrewsbury 19511, d. Holywell Perfection 36944 by Sefton of Holywell 14405.
 2084 III. (£3).—LEOPOLD C. PAGET, Middlethorpe Hall, York, for Dividend of Wharfedale, born Jan. 7, bred by the Earl of Sefton, Croxteth Hall, Lancs.; s. Croxteth Banker 2nd 16733, d. Tarbock Pattie 13th 22084 by Walton Turret 12th 9453.
 2085 E. N.—R. EDWARD SADLER, The Leasowes, Sutton Coldfield, Warwickshire, for Madcap of West Derby.

Class 341.—Middle White Boars, farrowed in 1916. [14 entries.]

- 2090 I. (£10).—LEOPOLD C. PAGET, Middlethorpe Hall, York, for boar, born Jan. 2; s. Wharfedale Corporal 19539, d. Croxteth Snowy 2nd 39896 by Headcorn Acrobat 16631.
 2086 II. (£5).—LEOPOLD C. PAGET, for boar, born Jan. 15; s. Wharfedale Corporal 19539, d. Wharfedale Gracious 34354 by Tarbock Turret 2nd 13115.
 2090 III. (£3).—JOHN CHIVERS, Histon, Cambs., for boar, born Jan. 11; s. Shrewsbury 19511, d. Histon Holly 42996 by Wharfedale Mandarin 18155.
 2094 E. N.—LEOPOLD C. PAGET.
 H. C.—2088. C.—2100.

Class 342.—Middle White Breeding Sows, farrowed in 1912, 1913, or 1914. [8 entries.]

- 2102 I. (£10, & E. N. for Champion).—JOHN CHIVERS, Histon, Cambs., for Perfection Pride 40036, born August 23, 1912, farrowed Jan. 18, bred by Charles Spencer, Brampton, Hunts; s. Holywell Jonathan 14435, d. Holywell Perfection 36944 by Sefton of Holywell 14405.
 2106 II. (£5).—LEOPOLD C. PAGET, Middlethorpe Hall, York, for Wharfedale Flapper, born March 5, 1914, farrowed Jan. 24; s. Earl of Wharfedale 16740, d. Wharfedale Joyful 15066 by Wharfedale Reveller 11529.
 2107 III. (£3).—R. E. W. STEPHENSON, Tue Brook, Liverpool, for Charlotte of Castlesand 36979, born Feb. 7, 1912, farrowed March 9, bred by the Earl of Sefton, Croxteth Hall, Liverpool; s. Reveller of Croxteth 15673, d. Rose of Tarbock 10th 30622 by Tarbock Prince 12103.
 2105 E. N.—LEOPOLD C. PAGET, for Croxteth Snowy 2nd.
 H. C.—2108, 2109.

Class 343.—Middle White Sows, farrowed in 1915. [12 entries.]

- 2111 I. (£10, & Champion).—JOHN CHIVERS, Histon, Cambs., for Histon Pride, born March 2; s. Shrewsbury 19511, d. Perfection's Pride 40036 by Holywell Jonathan 14435.
 2113 II. (£5).—R. E. W. STEPHENSON, Tue Brook, Liverpool, for Actress of West Derby, born Jan. 24, bred by the Trustees of the Earl of Lathom, Lathom Park, Ormskirk; s. Blythe Acrobat 18001, d. Lathom Pattie 6th 39832 by Tarbock Prince 12103.
 2119 III. (£3).—R. E. W. STEPHENSON, for Arietta of West Derby, born Jan. 25, bred by the Trustees of the Earl of Lathom, Lathom House, Ormskirk; s. Blythe David 18008, d. Lathom Rose 5th 34133 by Tarbock Prince 12103.
 2112 E. N.—JOHN CHIVERS, for Histon Lady.

Class 344.—Three Middle White Sows, farrowed in 1916. [18 entries.]

- 2121 I. (£10).—LEOPOLD C. PAGET, Middlethorpe Hall, York, for sows, born Jan. 3; s. Wharfedale Corporal 19539, d. Wharfedale Shepherders 2nd 43245 by Sentinel of Wharfedale 18123.
 2120 II. (£5).—LEOPOLD C. PAGET, for sows born Jan. 14; s. Dividend of Wharfedale (vol. 23), d. Wharfedale Spinster 40164 by Wharfedale China 15815.
 2122 III. (£3).—H. R. BERTON, Hammonds Farm, Checkendon, Reading, for sows, born Jan. 3; s. Wharfedale Constable 19535, d. Hammonds Himalaya 43833 by The Warden of Wharfedale 18701.
 2123 E. N.—LEOPOLD C. PAGET.
 H. C.—2123.

Tamworths.

Class 345.—Tamworth Boars, farrowed in 1912, 1913, or 1914. [No entry.]

Class 346.—Tamworth Boars, farrowed in 1915. [2 entries.]

- 2118 I. (£10).—ROBERT IBBOTSON, The Hawthorns, Knowle, Walsingham, for Knowle Vanguard 20659, born July 8; s. Knowle Maqqeen 3rd 12257, d. Salisbury Queen 2nd 43403 by Whitacre Enterprise 13501.

Prizes given by the National Pig Breeders' Association.
 s. Champion Gold Medal given by the National Pig Breeders' Association to the best Sow in Classes 345 and 346.

Award of Live Stock Prizes at Manchester, 1916. cix

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]
 2136 II. (£5).—**EGBERT DE HAMEL**, Middleton Hall, Tamworth, for boar, born Jan. 9; s. Morantus of Middleton 19015, d. Middleton Madera 19412 by Milton of Middleton 15821.

Class 347.—Tamworth Boars, farrowed in 1916. [9 entries.]

- 2140 I. (£10, & Champion.¹), & 2139 II. (£5, & R. N. for Champion.¹)—**ROBERT IBBOTSON**, The Hawthorns, Knowle, Warwickshire, for boars, born Jan. 3; s. General Joffre 19583, d. Knowle Lady Manners 18008 by Knowle Macqueen 3rd 18247.
 2138 III. (£3).—**ROBERT IBBOTSON**, for boar, born Jan. 2; s. Knowle Macqueen 3rd 18247, d. Salisbury Queen 2nd 43468 by Whitacre Enterprise 18301.
 2141 R. N.—**F. A. NEWDEGATE, M.P.**, Arbury, Nuneaton.
 H. C.—2145. C.—2137.

Class 348.—Tamworth Breeding Sows, farrowed in 1912, 1913, or 1914. [4 entries.]

- 2149 I. (£10, & R. N. for Champion.²)—**CHARLES THELLUSON**, Brodsworth Hall, Doncaster, for Brodsworth Content 40188, born Aug. 7, 1913, farrowed Jan. 4; s. Warwickshire 18217, d. Brodsworth Constance 37116 by Apricotina 14529.
 2147 II. (£5).—**ROBERT IBBOTSON**, The Hawthorns, Knowle, Warwickshire, for Salisbury Queen 2nd 43468, born March 31, 1914, farrowed Jan. 2, bred by H. O. Stephens, Cholderton, Salisbury; s. Whitacre Enterprise 18301, d. Cholderton Golden Queen 4th 34423 by Elford Rector 14569.
 2146 III. (£3).—**ROBERT IBBOTSON**, for Knowle Lady Manners 48008, born Sept. 10, 1914, farrowed Jan. 3; s. Knowle Macqueen 3rd 18247, d. Knowle Model 2nd 40276 by Osmaston Buxus 14633.
 2148 R. N.—**W. J. PITT**, The Albynes, Bridgnorth, for Webton Cherry 6th.

Class 349.—Tamworth Sows, farrowed in 1915. [1 entries.]

- 2151 I. (£10, & Champion.²)—**ROBERT IBBOTSON**, The Hawthorns, Knowle, Warwickshire, for Arbury 45923, born Jan. 2, bred by F. A. Newdegate, M.P., Arbury Hall, Nuneaton; s. Knowle Ambition 18219, d. Knowle Marian 37272 by Knowle Antonio 18011.
 2152 II. (£5).—**ROBERT IBBOTSON**, for Knowle Modula 18040, born March 3; s. Sunstar 18289, d. Knowle Model 2nd 40276 by Osmaston Buxus 14633.
 2153 III. (£3).—**W. J. PITT**, The Albynes, Bridgnorth, for Dorothy 2nd, born Jan. 2, bred by F. A. Newdegate M.P., Arbury Hall, Nuneaton; s. Knowle Ambition 18219, d. Middleton Morosa 43424 by Morantus of Middleton 15815.
 2150 R. N.—**EGBERT DE HAMEL**, Middleton Hall, Tamworth.

Class 350.—Three Tamworth Sows, farrowed in 1916. [4 entries.]

- 2155 I. (£10).—**ROBERT IBBOTSON**, The Hawthorns, Knowle, Warwickshire, for sows, born Jan. 2 and 3; ss. Knowle Macqueen 3rd 18247 and General Joffre 19518, ds. Salisbury Queen 2nd 43468 by Whitacre Enterprise 18301, and Knowle Lady Manners 46008 by Knowle Macqueen 3rd 18247.
 2156 II. (£5).—**F. A. NEWDEGATE, M.P.**, Arbury, Nuneaton, for sows, born Jan. 17; s. Knowle Ambition 18219, d. Bartonica by M.P. 18907.
 2157 III. (£3).—**CHARLES THELLUSON**, Brodsworth Hall, Doncaster, for sows, born Jan. 20; s. Mac, d. Brodsworth Concordia 37114 by Knowle Sylvanus 14617.
 2154 R. N.—**EGBERT DE HAMEL**, Middleton Hall, Tamworth.

Berkshires.

Class 351.—Berkshire Boars, farrowed in 1912, 1913, or 1914.

[10 entries.]

- 2167 I. (£10).—**W. HOWARD PALMER**, Stokes Farm, Wokingham, for Minley King 18384, born April 8, 1914, bred by L. Currie, Minley Manor, Farnborough, Hants; s. Minley Warrior 15982, d. Enham Waxdell 16146 by Sir Peter H. 18251.
 2161 II. (£5).—**G. S. F. EDWARDS**, Nunthorpe Hall, York, for Little John 18057, born June 5, 1914, bred by R. B. Vincent, Manor Farm, Waterston; s. Harrison Lad 18837, d. Compton Grace 18727 by Manor First Venture 18352.
 2159 III. (£3).—**WILFRED BUCKLEY**, Moundsnare Manor, Basingstoke, for Moundsnare Warrior 17864, born June 22, 1913; s. Moundsnare Curious 16022, d. Moundsnare Kernel 16029 by Axford Viscount 15008.
 2168 R. N.—**SIR HUGO M. FITZGERBERT, Bt.**, Tiesington Hall, Ashbourne, for Tiesington Laddie.
 H. C.—2158, 2160, 2162.

¹ Champion Gold Medal given by the National Pig Breeders' Association for the best Boar in Classes 345-347.

² Champion Gold Medal given by the National Pig Breeders' Association for the best Sow in Classes 348 and 349.

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor"]

Large Blacks.

Class 357.—Large Black Boars, farrowed in 1912, 1913, or 1914.

[6 entries.]

- 2214 I. (£10, & Champion.)—**TERAH F. HOOLEY**, Dry Drayton, near Cambridge, for Drayton Robin Hood 5187, born Jan 10, 1914; s. Docking Victor 4221, d. Drayton Ethel 10730 by Henley Achilles 1999
 2217 II. (£5.)—**THOMAS WARNE**, Trevisquite Manor, St. Mabyn, Cornwall for Trevisquite Prince 1989, born Jan 2, 1914; s. Treveglis Jockey 3811, d. Trevisquite Content 4th 6974 by Trevisquite Confidence 1203
 2218 III. (£3)—**HENRY J. KINGWELL**, Bow Grange, Totnes, Devon, for Brent Handy Man, born Feb 18, 1914; s. Cornwood Good Gift 4617, d. Brent Sunflower 24th 12028 by Tansor King Tom 2931
 2215 E. N.—**MRS. KAY-MOUAT**, Morton Farm, Castlemorton, Malvern, for Brent Kitchener.

Class 358.—Large Black Boars, farrowed in 1915.² [10 entries.]

- 2221 I. (£10, & R. N. for Champion.)—**KENNETH M. CLARK**, Sudbourne Hall, Orford, Suffolk, for Sudbourne Emperor 5878, born March 7; s. Brent Enterprise 4619, d. Sudbourne Sadie 2nd 11823 by Sudbourne Sutler 3325.
 2228 II. (£5.)—**F. A. JOHNS**, Cleave, Linton, Devon, for Cleave Dreadnought 2nd 5917, born July 4; s. Valley Treveglis That's Him 4579, d. Cleave Careful 2nd 18532 by Cleave Hero 3976
 2220 III. (£3.)—**MRS. CAMMELL**, White Lea, Baynards, Horsham, for Alfold Boisterous Boy 2nd 5649, born June 9; s. Drayton Babes Victor 4867, d. Alfold Smiling Lady 9th 12954 by Valky Happy Boy 3515
 2225 E. N.—**TERAH F. HOOLEY**, Dry Drayton, near Cambridge, for Drayton Don Quixote.
 H. C.—2224. C.—2223.

Class 359.—Large Black Boars, farrowed in 1916. [30 entries.]

- 2232 I. (£10.)—**KENNETH M. CLARK**, Sudbourne Hall, Orford, Suffolk, for boar, born Jan 2; s. Lord Lovel 4783, d. Drayton Bellona 14008 by Drayton Disappointment 2nd 4678.
 2233 II. (£5.)—**KENNETH M. CLARK**, for boar, born Jan 2, s. Lord Lovel 4783, d. Sudbourne Totie 8004 by Nigger 2597.
 2237 III. (£3.)—**GEORGE A. GOODCHILD**, Great Yeldham, Essex, for boar, born Jan. 13; s. Kibberv John 1st 5891, d. Tartar Queen 2nd 11612 by Bentley Budget 3085.
 2239 IV. (£2.)—**TERAH F. HOOLEY**, Dry Drayton, near Cambridge, for boar, born Jan 7; s. Drayton Robin Hood 5187, d. Bassingbourn Maid 2nd 14472 by Bassingbourn Duke 8607
 2240 E. N.—**ALFRED PLAYLE**, Bassingbourn, Cambs
 H. C.—2248. C.—2250.

Class 360.—Large Black Breeding Sows, farrowed in 1912, 1913, or 1914.

[8 entries.]

- 2260 I. (£10, & Champion.)—**KENNETH M. CLARK**, Sudbourne Hall, Orford, Suffolk, for Sudbourne Senora 14012, born Jan. 1, 1914, farrowed Jan. 1; s. Treveglis None Such 4108, d. Sudbourne Sadie 2nd 11823 by Sudbourne Sutler 3325.
 2262 II. (£5, & R. N. for Champion.)—**TERAH F. HOOLEY**, Dry Drayton, near Cambridge, for Bassingbourn Maid 2nd 14472, born Sept. 29, 1913, farrowed Jan. 7, bred by A. Playle, Bassingbourn, Cambs; s. Bassingbourn Duke 8607, d. Bassingbourn Lassie 11184 by Sudbourne Sutler 3325
 2265 III. (£5.)—**THOMAS WARNE**, Trevisquite Manor, St. Mabyn, Cornwall, for Trevisquite Content 8th 13470, born July 21, 1913, farrowed Feb 10; s. Treveglis Jockey 3811, d. Trevisquite Content 5th 10868 by Treveland Masterpiece 2267.
 2263 E. N.—**TERAH F. HOOLEY**, for Bassingbourn Princess 1st.
 H. C.—2261. C.—2264.

Class 361.—Large Black Sows, farrowed in 1916. [10 entries.]

- 2270 I. (£10.)—**GEORGE A. GOODCHILD**, Great Yeldham, Essex, for Tartar Queen 5th 15634, born Feb 1; s. Yeldham Pride 4401, d. Tartar Queen 4th 13284 by Yeldham Referendum 5881

¹ Champion Prize of £10 given by the Large Black Pig Society for the best Boar in Classes 357-359

² Prizes given by the Large Black Pig Society.

³ Silver Challenge Cup given by the Large Black Pig Society for the best Sow in Classes 360 and 361.

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[Unless otherwise stated the above animal named below was bred by exhibitor.]

2271 II (25) — **FRANK L. HOOKEY** Dry Drayton near Cambridge for **Drayton Ellenora** 1171 born Jan 15 s Docking, Dandy Dick 5135 d Docking, Luchin 14311 by Suburban 1 s nt 1041

2275 III (23) — **JOHN WARNE** 11 gonhaye Trevelyon Compound Road Cornwall for **Valley Thoughtful** 1111 b 13 bred by John O. Oliver Woodland Valley Grumpy and Road Valley Youngest 1981 d Valley Hopeful 15178 by Paington Co. 2271

2274 R. N. **JOHN WARNE** 11 Trevelyon Smiling Lady
 H. C. — 2277 O — 2272

Class 362 — *Three Large Black Sows, farrowed in 1916* [9 entries]

2281 I (210) — **FRANK L. HOOKEY** Dry Drayton near Cambridge for sows born Jan 7 s Drayton Robin Hood 5185 d Baskingbourn Maid 2nd 14472 by Baskingbourn Duke 3607

2280 II (25) — **GEORGE A. GOODCHILD** Great Yeldham Essex for sows born Jan 12 and 13 s Kibb 11 John 1st 5391 d Lark 11 Queen 4th 12224 by Yeldham Riferendum 1861 and Lark 11 Queen 2nd 11121 by B. ntl y Budget 3035

2288 III (23) — **W. & H. WHILLY** Primly Farm Palsgrave for sows born Jan 2 s Bient King 1st 1875 and Trevelyon Goliath 5385 s Trevelyon Queen 14756 by Trevelyon Bob 3rd 4565 and Primly Dora 11111 by Bient Happy 11 y 2219

2284 R. N. — **JOHN WARNE** 11 gonhaye Trevelyon Compound Road Cornwall, for Trevelyon Sunlight, Trevelyon Moonlight, and Trevelyon Starlight.
 H. C. — 2278 O — 2279

Lincolnshire Curly-coated.

Class 363 — *Lincolnshire Curly-coated Boars, farrowed in 1912, 1913, or 1914*
 [4 entries]

2290 I (210, & Champion) — **GERSHOM SIMPSON** Charnwood House Caythorpe Lowdham, Notts, for Charnwood Friar 2nd 3261 born Jan 29 1914 s Gibraltar Friar 6th 2697 d Charnwood Queen 2nd 8010 by Keal Loppa 2111

2287 II (25) — **FREDERICK H. BOWSER** Wigtoft Boston for **Callow Park Triumph** 2nd 2913 born Jan 20 1913 bred by T. G. Moore (Callow Park 11 u. s. Ivington Road Leicester s Peterborough Par 1st 2739 d Callow Park Blanch 7528 by Caythorpe Emperor 1391

2286 III (23) — **F. DONALD GROUND** Market Place March Cambs, for **Bold King** 2897 born in Jan 1913 bred by William Abbott Swanton Colkington, s Alvingham King 4th 2033 d Bold Betty 4th 6018 by Swanton Captain 877

2288 R. N. — **GEORGE FRER** Toilethorpe House Deeping St Nicholas Spalding for Charnwood Friar 3rd

Class 364 — *Lincolnshire Curly-coated Boars, farrowed in 1915*
 [4 entries]

2292 I (210 & R. N. for Champion) — **GEORGE GODSON** Ayraby, Heckington for Heckington Long Tom, born April 19 s Rookery Tom of The Glen 3117 d Heckington Judy 9872 by Lister (Callow Park 11 741

2294 II (25) — **GERSHOM SIMPSON** Charnwood House Caythorpe Lowdham, Notts for Charnwood Count 3rd, born May 3 s Huttons Charnwood 1249 d Charnwood Duchess 8th 9502 by Gibraltar Friar 8th 2697

2291 III (23) — **HLNRY CAUDWELL** Old Leake Boston for **Wigtoft Herald**, born Jan 20 bred by T. G. Bowser Wigtoft Boston s Callow Park Triumph 2nd 2739 d Wigtoft Princess 12th 3110 by Westfield March 2399

Class 365 — *Lincolnshire Curly-coated Boars, farrowed in 1916*
 [9 entries]

2301 I (210) — **MAJOR I. ROYDS M.P.** Holy Cross Caythorpe, Grantham for boar, born Jan 8 s Lufford Caythorpe d Caythorpe Lucy 2nd 10412 by Vainora Friar 2673

2299 II (25) — **GEORGE GODSON** Ayraby Heckington for boar born Jan 4 s Rookery Tom of the Glen 3117 d Heckington Iris 3132 by Hemswell Parlier George 2745

2297 III (23) — **GEORGE FRER**, Toilethorpe House Deeping St Nicholas Spalding, for Deeping Success, born Jan 17 s Charnwood Friar 3rd 1971 d Deeping Pride 4th 9916 by Vainora Deeping 2141

2295 R. N. **FREDERICK H. BOWSER** Wigtoft Boston for **Wigtoft Captain Walker**,
 H. C. — 2278

1. Champion Prize of £5 5s. given by the Lincolnshire Curly-coated Pig Breeders' Association for the best Boar in Classes 363-365

A. Prizes given by the Lincolnshire Curly-coated Pig Breeders' Association.

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[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 366.—*Lincolnshire Curly-coated Breeding Sows, farrowed in 1912, 1913, or 1911.* [8 entries.]

2304 I. (£10, & Champion.)—HENRY CAUDWELL, Old Leake, Boston, for *Midville Eva* 4th 8576, born Jan. 30, 1912, farrowed March 7; s. *Burton Hillman* 2819, d. *Midville Princess Eva* 7th 9088 by *Caythorpe Emperor* 1391.

2305 II. (£5.)—GEORGE FRER, Toleshorpe House, Deeping St Nicholas, Spalding, for *Deeping Pride* 49th 9950, born Jan. 10, 1914, farrowed Jan. 5; s. *Vainona Deeping* 2141 d. *Deeping Pride* 40th 7870 by *Postland King* 1281.

2311 III. (£3.)—GERSHOM SIMPSON, Charnwood House, Caythorpe, Lowdham, Notts., for *Charnwood Queen* 5th 9598, born Jan. 28, 1914, farrowed March 10; s. *Gibraltar Friar* 6th 2897, d. *Charnwood Queen* 2nd 8010 by *Keal Topper* 2111.

2309 E. N.—GERSHOM SIMPSON, for *Charnwood Duchess* 3rd.

Class 367.—*Lincolnshire Curly-coated Sows, farrowed in 1915.* [5 entries.]

2312 I. (£10, & E. N. for Champion.)—HENRY CAUDWELL, Old Leake, Boston, for *Midville Beauty*, born March 25; s. *Caythorpe Vainona* 2973, d. *Midville Jewel* 9478 by *Gainsborough Ben Battle* 3185.

2318 II. (£5.)—F. DONALD GROUNDS, Market Place, March, Cambs., for *March Bobtail* 2nd, born July 23; s. *Bold King* 2807, d. *Marshland Bobtail* 10146 by *Marshland Duke* 2073.

2316 III. (£3.)—GERSHOM SIMPSON, Charnwood House, Caythorpe, Lowdham, Notts., for *Charnwood Tulip* 3rd, born Jan. 31; s. *Charnwood Earl* 2nd 3029, d. *Charnwood Tulip* 2nd 5958 by *Gainsborough Masterpiece* 3rd 1481.

2314 E. N.—F. DONALD GROUNDS, for *March Marion* 35th.

Class 368.—*Three Lincolnshire Curly-coated Sows, farrowed in 1916.*

[5 entries.]

2319 I. (£10.) GEORGE GODSON, Asgarby, Heckington, for sows, born Jan. 4; s. *Rookery Tom* of the *Glen* 8117, d. *Heckington Iris* 9132 by *Hornswall Farmer George* 4th 2745.

2317 II. (£5.)—FREDERICK E. BOWSER, Wigtoft, Boston, for *Wigtoft Sensation* 29th 30th and 31st, born Jan. 29; s. *Keal Billy B.* 3897, d. *Wigtoft Sensation* 6th 8638 by *Westfield March* 2368.

2320 III. (£3.)—O. FELLOWS MOSLEY, Leasingham, Skeaford, for sows, born Jan. 4; s. *Burton Hermes* d. *Laford Alice* 4th 10820 by *Graby Magistrate* 3083.

2318 E. N.—GEORGE FRER, Toleshorpe House, Deeping St. Nicholas, Spalding.

POULTRY.

By "Cook," "Hen," "Gander," and "Goose," are meant birds hatched previous to January 1, 1916; and by "Cockerel" and "Pullet" are meant birds hatched in 1916.

Class 369.—*Silver Grey Dorking Cocks.* [11 entries.]

10 I. (30s., & Champion.)—C. SNEDDON, Ribby Road, Kirkham.

5 II. (20s.)—JOHN MECHIE, Auchtermuchty, N.B.

2 III. (10s.)—ROBERT AITKENHEAD, Estate Office, Tongewood, Hawkhurst.

1 E. N.—ARTHUR C. MAJOR, Ditton, Langley, Bucks.

E. C.—9.

C.—7.

Class 370.—*Silver Grey Dorking Hens.* [8 entries.]

15 I. (30s., & E. N. for Champion.)—JOHN MECHIE, Auchtermuchty, N.B.

16 II. (20s.)—JAMES ROGERS, Forneth, Blairgowrie, N.B.

13 III. (10s.) & 17 E. N.—ARTHUR C. MAJOR, Ditton, Langley, Bucks.

E. C.—14.

C.—13.

Class 371.—*Dark Coloured Dorking Cocks.* [14 entries.]

24 I. (30s., & Champion.)—MISS MARGARET FAWCETT, Ormesby, Yorks.

23 II. (20s.)—C. SNEDDON, Ribby Road, Kirkham.

26 III. (10s.)—ARTHUR C. MAJOR, Ditton, Langley, Bucks.

22 E. N.—JOHN MECHIE, Auchtermuchty, N.B.

E. C.—23.

C.—22.

* Champion Prize of £5 ss. given by the Lincolnshire Curly-coated Pig Breeders' Association for the best Sow in Classes 366 and 367.

* Special Prize, value £1 ls., given by the Dorking Club for the best Silver Grey Dorking.

* Special Prize, value £1 ls., given by the Dorking Club for the best Dark Coloured Dorking.

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Class 372.—Dark Coloured Dorking Hens. [9 entries.]

- 39 I. (30s. & R. N. for Champion.) RALPH ALFY, Buckshaw Hall, Muxton, Chorley.
 38 II. (20s.)—C SNIDDON, Ribby Road, Kirkstun.
 37 III. (10s.)—H. P. DOUGLAS, The Woodlands, Hook, co Durham.
 36 E. N.—ARTHUR C. MAJOR, Ditton, Langley, Bucks.
 H. C.—40. C.—II.

Class 373.—Dorking Cockerels, any colour. [9 entries.]

- 49 I. (30s. & R. N. for Champion.) & 44 II. (20s.) CAPT. PHILIP HORNBY, Somerton.
 51 III. (10s.)—F. A. NEWDEGATE, M.P., Arbury, Nuneaton
 45 E. N.—JOHN MROCH, Auchtermuchty, N.B.
 H. C.—47. C.—48.

Class 374.—Dorking Pullets, any colour. [8 entries.]

- 56 I. (30s. & Champion.)—ARTHUR C. MAJOR, Ditton, Langley, Bucks.
 58 II. (20s.)—F. A. NEWDEGATE, M.P., Arbury, Nuneaton.
 59 III. (10s.) & 54 E. N.—CAPT. PHILIP HORNBY, Somerton, Somerset.
 H. C.—52. C.—55.

Class 375.—Langshan Cocks or Cockerels. [6 entries.]

- 60 I. (30s.)—J. W. WALKER, Normanstead, Henley-on-Thames.
 62 II. (20s.)—W. J. PORTER, Post Office, Stalmine.
 63 III. (10s.)—A. SIMPSON, Burnley Road, Fadiham.
 61 E. N.—R. CLARKE, Eaton, Tarporeley.
 H. C.—64.

Class 376.—Langshan Hens or Pullets. [14 entries.]

- 79 I. (30s.) & 77 III. (10s.)—R. ANTHONY, Home Farm, Muxton, Chorley.
 72 II. (20s.)—J. W. WALKER, Normanstead, Henley-on-Thames.
 68 E. N.—W. J. PORTER, Post Office, Stalmine.
 H. C.—76. C.—86.

Class 377.—Croad Langshan Cocks or Cockerels. [15 entries.]

- 88 I. (30s.)—WILLIAM RAY, Braithwaite, Kenwick.
 82 II. (20s.)—W. J. HURD, Grove Road West, Christchurch, Hants.
 89 III. (10s.)—E. J. TAUNTON, Tower House, Bemerton, Salisbury.
 84 E. N.—MRS. GREGORY, Elloughton, Brough, E. Yorks.
 H. C.—87. C.—80.

Class 378.—Croad Langshan Hens or Pullets [10 entries.]

- 101 I. (30s.)—WHITAKER & TOOTILL, Quarry Farm, Pool, Leeds.
 99 II. (20s.)—T. RICHARDS, 17 Church Street, Loanhead, Midlothian.
 96 III. (10s.) & 102 E. N.—HERBERT P. MULLEN, The Red House, Ovington, Ayrshire.
 H. C.—103. C.—100.

Class 379.—Brahma Cocks or Cockerels. [10 entries.]

- 105 I. (30s.)—S. W. THOMAS, Glasfryn, Forest Fuch, Swansea.
 109 II. (20s.) & 114 E. N.—ARTHUR E. WARD, Tori-Shinden, Marine Drive, Rhon-on-Sea.
 113 III. (10s.)—W. MCGIBBON, Burnside, Rolleston-on-Dove, Burton-on-Trent.
 H. C.—106, 110, 111

Class 380.—Brahma Hens or Pullets. [9 entries.]

- 125 I. (30s.) & 119 III. (10s.)—S. W. THOMAS, Glasfryn, Forest Fuch, Swansea.
 118 II. (20s.)—A. E. WARD, Tori-Shinden, Marine Drive, Rhon-on-Sea, Gwlwyn Bay.
 113 E. N.—ALFRED NUTTALL, 62 Bolton Road, Ramsbottom.
 H. C.—117, 120, 122. C.—116.

Class 381.—Cochin Cocks or Cockerels. [7 entries.]

- 128 I. (30s.), 126 II. (20s.), & 130 III. (10s.)—G. H. PROCTER, Flass House, Durham.
 124 E. N.—W. M. DAVIES, 32 New Road, Llandilo.
 H. C.—125, 127. C.—129.

Class 382.—Cochin Hens or Pullets. [3 entries.]

- 131 I. (30s.), 133 II. (20s.), & 132 III. (10s.)—G. H. PROCTER, Flass House, Durham.

¹ Special Prize, value £1 ls., given by the Dorking Club for the best Dark Coloured Dorking

² Special Prize, value £1 ls., given by the Dorking Club for the best Dorking Chickens hatched in 1916.

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Class 383.—Red Sussex Cocks. [14 entries.]

- 139 I. (30s., & R. N. for Champion¹.)—W. SMITH, 29 Mayfield View, Wyke, Bradford.
 137 II. (20s.)—S. F. EDGE, Gallops Homestead, Ditchling, Sussex.
 141 III. (10s.) & 145 R. N.—A. J. FALKENSTEIN, Dallington, Sussex.
 H. C.—135, 144. C.—140.

Class 384.—Red Sussex Hens. [9 entries.]

- 148 I. (30s., & Champion¹), 156 III. (10s.), & 153 R. N.—A. J. FALKENSTEIN, Dallington.
 154 II. (20s.)—S. F. EDGE, Gallops Homestead, Ditchling, Sussex.
 H. C.—150. C.—155.

Class 385.—Red Sussex Cockerels. [8 entries.]

- 157 I. (30s.)—S. F. EDGE, Gallops Homestead, Ditchling, Sussex.
 159 II. (20s.)—A. J. FALKENSTEIN, Dallington, Sussex.
 163 III. (10s.)—C. & E. STEPHENSON, Burton House, Stafford.
 164 R. N.—H. S. HODGES, Knowle Poultry Farm, Heathfield, Sussex.
 H. C.—161. C.—158.

Class 386.—Red Sussex Pullets. [10 entries.]

- 167 I. (30s.), & 171 III. (10s.)—DR. G. W. WHITELEY, Hamilton House, Downton, Wilts.
 166 II. (20s.)—S. F. EDGE, Gallops Homestead, Ditchling, Sussex.
 165 R. N.—A. J. FALKENSTEIN, Dallington, Sussex.
 H. C.—168. C.—169.

Class 387.—Light Sussex Cocks. [12 entries.]

- 183 I. (30s.)—C. & E. STEPHENSON, Burton House, Stafford.
 185 II. (20s.)—F. A. NEWDEGATE, M.P., Arbury, Nuneaton.
 178 III. (10s.)—THE REV. GEORGE A. CRAWSHAY, Melchbourne Vicarage, Beds.
 181 R. N.—MOUNTAIN ASH POULTRY FARM, Addlestone.
 H. C.—175. C.—188.

Class 388.—Light Sussex Hens. [20 entries.]

- 189 I. (30s., & Champion².)—FRANK H. WHEELER, The Past, Beckley, Sussex.
 190 II. (20s.)—THE REV. GEORGE A. CRAWSHAY, Melchbourne Vicarage, Beds.
 197 III. (10s.)—C. & E. STEPHENSON, Burton House, Stafford.
 188 R. N.—S. F. EDGE, Gallops Homestead, Ditchling, Sussex.
 H. C.—205. C.—202.

Class 389.—Light Sussex Cockerels. [14 entries.]

- 209 I. (30s.)—THE REV. GEORGE A. CRAWSHAY, Melchbourne Vicarage, Beds.
 218 II. (20s.), & 220 R. N.—F. A. NEWDEGATE, M.P., Arbury, Nuneaton.
 216 III. (10s.)—S. F. EDGE, Gallops Homestead, Ditchling, Sussex.
 H. C.—212. C.—215.

Class 390.—Light Sussex Pullets. [16 entries.]

- 225 I. (30s., & R. N. for Champion².)—S. F. EDGE, Gallops Homestead, Ditchling, Sussex.
 220 II. (20s.), & 230 R. N.—A. J. FALKENSTEIN, Dallington, Sussex.
 232 III. (10s.)—ROBERT L. MOND, Combe Bank, Sundridge, Sevenoaks.
 H. C.—234. C.—238.

Class 391.—Speckled Sussex Cocks. [14 entries.]

- 239 I. (30s.)—S. F. EDGE, Gallops Homestead, Ditchling, Sussex.
 244 II. (20s.)—W. SMITH, 29 Mayfield View, Wyke, Bradford.
 245 III. (10s.), & 248 R. N.—ROBERT L. MOND, Combe Bank, Sundridge, Sevenoaks.
 H. C.—240. C.—237.

Class 392.—Speckled Sussex Hens. [13 entries.]

- 251 I. (30s., & Champion²), 260 II. (20s.), & 265 III. (10s.)—ROBERT L. MOND, Combe Bank, Sundridge, Sevenoaks.
 250 R. N.—ARNOLD KEVIL, Stoclands Sussex Farms, Hadlow Down, Sussex.
 H. C.—252. C.—261.

Class 393.—Speckled Sussex Cockerels. [13 entries.]

- 268 I. (30s.)—ROBERT L. MOND, Combe Bank, Sundridge, Sevenoaks.
 272 II. (20s.)—ARNOLD KEVIL, Stoclands Sussex Farms, Hadlow Down, Sussex.
 270 III. (10s.), & 275 R. N.—S. F. EDGE, Gallops Homestead, Ditchling, Sussex.
 H. C.—264. C.—266.

¹ Special Prize given by the Sussex Poultry Club for the best Red Sussex in Classes 383-388.

² Special Prize given by the Sussex Poultry Club for the best Light Sussex in Classes 387-390.

³ Special Prize given by the Sussex Poultry Club for the best Speckled Sussex in Classes 391-394.

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Class 394.—Speckled Sussex Pullets. [13 entries.]

- 289 I. (30s., & R. N. for Champion.)¹ F. A. NEWDEGATE, M.P., Arbury, Nuneaton.
 286 II. (20s.) & 278 III. (10s.)—S. F. RIDGE, Gallops Homestead, Ditchling, Sussex.
 277 R. N.—ROBERT L. MOND, Combe Bank, Sundridge, Sevenoaks.
 H. C.—285. C.—284.

Class 395.—Brown Sussex Cocks or Cockerels. [7 entries.]

- 290 I. (30s., & Champion²) & 296 III. (10s.)—JOHN ADE, Grove Hill Farm, Hellingly
 291 II. (20s.)—J. FAIRALL JUN., Sandhills Farm, Bodle Street, Hailsham.
 292 R. N.—HOWARD BROTHERS, Hellingly Mill, Sussex.
 H. C.—295. C.—294.

Class 396.—Brown Sussex Hens or Pullets. [9 entries.]

- 297 I. (30s., & R. N. for Champion²), & 299 III. (10s.) J. FAIRALL, JUN., Sandhills Farm
 Bodle Street, Hailsham.
 303 II. (20s.)—HOWARD BROTHERS, Hellingly Mill, Sussex.
 304 R. N.—JOHN ADE, Grove Hill Farm, Hellingly, Sussex.
 H. C.—300. C.—298.

Class 397.—Faverolle Cocks or Cockerels. [13 entries.]

- 315 I. (30s.)—WHITAKER & TOOTILL, Quarry Farm, Pool, Leeds.
 308 II. (20s.)—MRS. C. M. WILSON-BROWNE, The Crag, Sutton Coldfield.
 311 III. (10s.)—J. G. PHILLIPS, Boxwood, Awkley, Yorks.
 317 R. N.—GEORGE DAVIES, MORRIS Brook Poultry Farm, Grappenhall, Warrington.
 H. C.—314. C.—306.

Class 398.—Faverolle Hens or Pullets. [12 entries.]

- 326 I. (30s.)—T. J. DAVIES, Maesyderi, Abercrave, Breconshire.
 319 II. (20s.)—WHITAKER & TOOTILL, Quarry Farm, Pool, Leeds.
 326 III. (10s.)—J. G. PHILLIPS, Boxwood, Awkley, Yorks.
 322 R. N.—C. H. BRADLEY, Tibberton, Gloucester.
 H. C.—330. C.—320.

Class 399.—Maline Cocks or Cockerels. [5 entries.]

- 333 I. (30s., & Champion.³)—T. J. DAVIES, Maesyderi, Abercrave, Breconshire.
 332 II. (20s.)—S. W. THOMAS, Glastryn, Forest Fach, Swansea.
 331 III. (10s.), & 335 R. N.—MAJOR F. HERBERT, Ty-Gwyn, Raglan, Mon.

Class 400.—Maline Hens or Pullets. [9 entries.]

- 336 I. (30s., & R. N. for Champion.³)—T. J. DAVIES, Maesyderi, Abercrave, Breconshire.
 336 II. (20s.), & 343 III. (10s.)—S. W. THOMAS, Glastryn, Forest Fach, Swansea.
 342 R. N.—MAJOR F. HERBERT, Ty-Gwyn, Raglan, Mon.
 H. C.—344. C.—340.

*Class 401.—Maline Cocks or Cockerels, Hens or Pullets, any variety except
 (beauc or White). [9 entries.]*

- 351 I. (30s.)—T. J. DAVIES, Maesyderi, Abercrave, Breconshire.
 346 II. (20s.) MRS. TERROT, Wispington House, Cookham, Berks.
 350 III. (10s.), & 348 R. N.—MAJOR F. HERBERT, Ty-Gwyn, Raglan, Mon.
 H. C.—347. C.—340.

Class 402.—Campine Cocks or Cockerels. [18 entries.]

- 354 I. (30s., & Champion.⁴) & 359 III. (10s.)—R. ANTHONY, Home Farm, Euxton, Chorley.
 360 II. (20s., & R. N. for Champion.⁴) WHITAKER & TOOTILL, Quarry Farm, Pool,
 Leeds.
 366 R. N.—MRS. WINSLOP, Dunedale, Frodsham.
 H. C.—366, 363, 371. C.—361.

Class 403.—Campine Hens or Pullets. [15 entries.]

- 379 I. (30s.)—R. ANTHONY, Home Farm, Euxton, Chorley.
 376 II. (20s.)—REV. W. LEWIS JONES, Heyope Rectory, Knighton.
 381 III. (10s.)—REV. W. SHUBANTON, Acton Burnall Rectory, Shrewsbury.
 377 R. N.—WHITAKER & TOOTILL, Quarry Farm, Pool, Leeds.
 H. C.—363, 364, 366. C.—378.

¹ Special Prize given by the Sussex Poultry Club for the best Speckled Sussex in
 Classes 391-394.

² Special Prize given by the Sussex Poultry Club for the best Brown Sussex in
 Classes 395 and 396.

³ Silver Medal given by the Malines Poultry Club for the best Maline in
 Classes 397-401.

⁴ Silver Medal given through the Campine Club for the best Campine.

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Class 404.—White Wyandotte Cocks. [16 entries.]

- 390 I. (30s. & Champion.¹)—R ANTHONY, Home Farm, Euxton, Chorley, Lancs
387 II. (20s.)—J B KERR Hivestoun Castle, Dollar, N B
402 III. (10s.)—P M KNIGHT Oakworth, Yorks
394 R. N.—W & J LIMPIN, 130 Bolton Road West, Ramsbottom

Class 405.—White Wyandotte Hens [15 entries.]

- 415 I. (30s. & R. N for Champion.¹)—MRS J FARNHAM, Holdfast Poultry Farm, Haslemere
413 II. (20s.)—TOM H FURNESS Carlton House, Chesterfield
404 III. (10s.)—R ANTHONY Home Farm, Euxton, Chorley, Lancs
405 R. N.—HELLIWELL & UTLEY Banks Fields, Mytholmroyd
H. C.—407, 412 G.—408, 408.

Class 406.—White Wyandotte Cookerels [17 entries]

- 421 I. (30s.)—TOM H FURNESS Carlton House, Chesterfield
430 II. (20s.)—O H BRITTON Great Longstone, Derbyshire
418 III. (10s.)—W E H HANCOCK c/o J Fitley, Abbotsford, Keynsham, Bristol
422 R. N.—H HOLLINGSWORTH 25 Stanford Havers, Ongar
H. C.—424, 428 G.—418, 429

Class 407.—White Wyandotte Pullets. [15 entries]

- 435 I. (30s.)—TOM H FURNESS Carlton House, Chesterfield
442 II. (20s.)—H P DOUGLAS The Woodlands, Crook, Co Durham
440 III. (10s.)—G BLUNDELL Blackleach House, Woodplumpton, Preston
448 R. N.—J PINCH & SON Glebe Poultry Farm, St Kew, Wadebridge
H. C.—443, 445 G.—448, 441, 447

Class 408.—Black Wyandotte Cocks [6 entries]

- 450 I. (30s. & Champion.²)—T C HEATH, Keels, Newcastle, Staffs
451 II. (20s.)—T J ALTY & SON, Vine Cottage, Pilling, Garstang
452 III. (10s.)—GEORGE H LEBON, The Greave, Rochdale
454 R. N.—ROGER HARGREAVES, Banks Farm, Whalley, Lancs
H. C.—455.

Class 409.—Black Wyandotte Hens, [11 entries]

- 459 I. (30s. & R. N for Champion.²)—T C HEATH, Keels, Newcastle, Staffs.
463 II. (20s. & 468 R. N.)—HERBERT GARLICK, Kirkby Lonsdale
460 III. (10s.)—ROGER HARGREAVES, Banks Farm, Whalley, Lancs
H. C.—457, 462, 465 G.—461

Class 410.—Black Wyandotte Cookerels [4 entries]

- 469 I. (30s.)—GEORGE WOOD, Westfield, Grestland, Halifax
470 II. (20s.)—S C KING, Old Place, Fulborough.
467 III. (10s.)—ALAN MOSS, Charnwood Poultry Farm, Shephard, near Loughborough

Class 411.—Black Wyandotte Pullets. [6 entries]

- 471 I. (30s.)—HERBERT GARLICK, Kirkby Lonsdale
472 II. (20s.)—TOM H FURNESS, Carlton House, Chesterfield
475 III. (10s.)—GEORGE WOOD, Westfield, Grestland, Halifax
478 R. N.—ALAN MOSS, Charnwood Poultry Farm, Shephard, near Loughborough

Class 412.—Gold or Silver Laced Wyandotte Cocks or Cookerels. [8 entries.]

- 473 I. (30s.), & 484 II. (20s.)—W H SMITH & SON, Peets Farm, Southport
479 III. (10s.)—J GREENWOOD, Old White Bear, Chesham, Keighley
480 R. N.—J W SMITH, 30 St Leonard Street, Lanark, N B
H. C.—477, 482

Class 413.—Gold or Silver Laced Wyandotte Hens or Pullets. [9 entries.]

- 491 I. (30s.)—J W SMITH 30, St Leonard Street, Lanark, N B
488 II. (20s.)—TOM H FURNESS Carlton House, Chesterfield
485 III. (10s.)—W H SMITH & SON, Peets Farm, Southport.
496 R. N.—THOMAS LOCKWOOD, Pataley Bridge, Yorks
H. C.—490 G.—488.

¹ Special Prize of 10s and the "Visiting Cup" value 85 given by the White Wyandotte Club for the best White Wyandotte in Classes 404-407.

² Special Prize of 10s given by the Black Wyandotte Club for the best Black Wyandotte in Classes 408-411.

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Class 414.—Blue Wyandotte Cocks or Cockerels. [7 entries.]

- 500 I. (30s).—J M BUXTON, Spring End, Low Row, Richmond, Yorks
 494 II. (20s).—MRS W HOLDSWORTH, Bernard House, Newbridge Crescent, Wolverhampton
 495 III. (10s).—T C OLARK, Avenue Road, Wolverhampton
 496 R. N. ALBERT WADE, Ashton House, Ashton Chesler

Class 415.—Blue Wyandotte Hens or Pullets. [7 entries.]

- 506 I. (30s). & 503 II. (20s).—MRS W HOLDSWORTH, Bernard House, Newbridge Crescent, Wolverhampton
 505 III. (10s).—TOM H FURNESS, Carlton House, Chesterfield
 504 R. N.—C BISHOP, The Homestead, Ash Hill, Wolverhampton
 C.—502

Class 416.—Wyandotte Cocks or Cockerels, any other variety. [11 entries.]

- 508 I. (30s). & 513 R. N.—RICHARD WARSON, Thorn Garth Poultry Farm, Thackley Bradford
 519 II. (20s).—MICHAEL HARRISON, Shaw House, Edmond Castle, Carlisle
 512 III. (10s).—W H BREWER, Uxella Poultry Farm, Lostwithiel
 H. C.—509, 511 C.—510, 512, 518

Class 417.—Wyandotte Hens or Pullets, any other variety. [12 entries.]

- 523 I. (30s).—TOM H FURNESS, Carlton House, Chesterfield
 523 II. (20s).—R HOWARD, Millfield Poultry Farm, Thingwall Barnston, Birkenhead
 522 III. (10s).—L H WARR, Kingsland Poultry Farm, Beamington
 524 R. N.—MICHAEL HARRISON, Shaw House, Edmond Castle, Carlisle
 H. C.—526 C.—523, 527

Class 418.—Buff Orpington Cocks. [29 entries.]

- 535 I. (30s. & R. N. for Champion¹). & 543 III. (10s).—MISS LAURA LE PATOURL, Edenstead Crosby-on Eden
 537 II. (20s).—ROBERT L MOND, Combe Bank, Sundridge, Sevenoaks
 536 R. N.—W M BELL, St Leonard's Poultry Farm, Kingwood
 H. C.—542, 546 553, 555, 561 C.—541, 543

Class 419.—Buff Orpington Hens. [6 entries.]

- 564 I. (30s. & Champion¹).—ROBERT L MOND, Combe Bank, Sundridge, Sevenoaks
 567 II. (20s).—E R JONES, Woodland Farm, Crumpsall, Manchester
 565 III. (10s).—T. J DAVIES, Maesyderf, Abercraive, Breconshire

Class 420.—Buff Orpington Cockerels. [10 entries.]

- 569 I. (30s).—ROBERT L MOND, Combe Bank, Sundridge, Sevenoaks
 573 II. (20s). & 577 III. (10s).—F M. ROGERS, Stoford Poultry Farm, West Buckland, Wellington, Somerset
 576 R. N.—S CUMMINGS, Yew Tree, Vivel, Milnthorpe

Class 421.—Buff Orpington Pullets. [15 entries.]

- 581 I. (30s). SAMUEL HUNTER, Shavington Lodge, Crews
 579 II. (20s).—ROBERT L MOND, Combe Bank, Sundridge, Sevenoaks
 583 III. (10s). & 588 R. N. F M ROGERS, Stoford Poultry Farm, West Buckland, Wellington, Somerset
 H. C.—584, 589 C.—586

Class 422.—White Orpington Cocks. [13 entries.]

- 596 I. (30s).—ROBERT L MOND, Combe Bank, Sundridge, Sevenoaks
 597 II. (20s).—MAJOR H WAITS, Brookdale, Alderley Edge
 603 III. (10s).—MRS J FARNHAM, Holdfast Poultry Farm, Haslemere
 606 R. N.—T J DAVIES, Maesyderf, Abercraive, Breconshire
 C.—601, 604

Class 423.—White Orpington Hens. [18 entries.]

- 607 I. (30s).—WHITAKER & TOOTHILL, Quarry Farm, Pool, Leeds
 609 II. (20s).—ROBERT L MOND, Combe Bank, Sundridge, Sevenoaks
 610 III. (10s). & 615 R. N.—R C S WADE, 4 Victoria Avenue, Saltain, Shipley.
 H. C.—608, 614 C.—611, 613 618

¹ A Piece of Plate given by the Buff Orpington Club for the best Buff Orpington in Classes 418-421.

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Class 424.—*White Orpington Cockerels.* [4 entries.]

- 628 I. (30s. & Champion¹) & 629 E. N.—MURRAY LINDNER, Ham Court Poultry Farm, Charlton Kings, Cheltenham
626 II. (20s.) R O S WADE, 4 Victoria Avenue Saltam Shipley
627 III. (10s.)—MRS J FARNHAM, Holdfast Poultry Farm Haslemere

Class 425.—*White Orpington Pullets.* [1 entries.]

- 632 I. (30s. & Champion²), 631 III. (10s.) & 62) E. N.—MURRAY LINDNER, Ham Court Poultry Farm Charlton Kings, Cheltenham
630 II. (20s.)—MRS J FARNHAM, Holdfast Poultry Farm, Haslemere

Class 426.—*Black Orpington Cocks.* [20 entries.]

- 650 I. (30s. & Champion³), & 652 III. (10s.)—ROBERT L MOND, Combe Bank, Sundridge, Sevenoaks
654 II. (20s.)—T J ALFY & SON, Vine Cottage, Pilling, Garstang
655 E. N.—F O PIERCE, The Limes Burstons, Diss
H. C.—638, 648, 649 C.—641

Class 427.—*Black Orpington Hens.* [16 entries.]

- 653 I. (30s. & E. N. for Champion⁴), & 666 E. N.—ROBERT L MOND, Combe Bank, Sundridge Sevenoaks
668 II. (20s.)—W H SMITH & SON, Peets Farm, Southport
654 III. (10s.)—F O PIERCE, The Limes Burstons, Diss
H. C.—659, 661, 665. C.—657

Class 428.—*Black Orpington Cockerels.* [3 entries.]

- 670 I. (30s.)—THOMAS HOYLE, Savile Royd, Halifax
669 II. (20s.), & 671 III. (10s.)—W. M. BELL, St Leonard's Poultry Farm, Ringwood

Class 429.—*Black Orpington Pullets.* [3 entries.]

- 672 I. (30s.)—W. M. BELL, St Leonard's Poultry Farm, Ringwood
673 II. (20s.)—THOMAS HOYLE, Savile Royd, Halifax
674 III. (10s.)—JOHNS BROTHERS, Trentunney Farm, St. Enleddion, Cornwall

Class 430.—*Blue Orpington Cocks or Cockerels.* [8 entries.]

- 676 I. (30s. & Champion⁵), & 680 III. (10s.)—ROBERT L MOND, Combe Bank, Sundridge, Sevenoaks
675 II. (20s.) & 682 E. N.—MAJOR MAX J DE BATHE, Hartley Court, Reading
H. C.—679 C.—681

Class 431.—*Blue Orpington Hens or Pullets.* [6 entries.]

- 683 I. (30s. & Champion⁶) & 688 II. (20s.)—ROBERT L MOND, Combe Bank, Sundridge, Sevenoaks
686 III. (10s.)—DR E SUTCLIFFE, Long Sutton, Lincs
687 E. N.—T MARSH 144 Hope Street, Leigh, Lincs

Class 432.—*Orpington Cocks or Cockerels, any other variety.* [2 entries.]

- 690 I. (30s.), & 689 II. (20s.)—L H BACCHUS, Brooklyn Poultry Farm, Ifield, Crawley,

Class 433.—*Orpington Hens or Pullets, any other variety.* [2 entries.]

- 692 I. (30s.), & 691 II. (20s.)—L H BACCHUS, Brooklyn Poultry Farm, Ifield, Crawley

Class 434.—*British Rhode Island Red Cocks.* [36 entries.]

- 726 I. (30s. & Champion⁷)—WHITAKER & TOOTHILL, Quarry Farm, Pool, Leeds.
720 II. (20s.)—MRS CHRISTINE COLBECK, Boyle Hall, West Ardsley, Wakefield
714 III. (10s.)—W G STEBBINGS, Salwick, Preston.
700 E. N.—W R ABBEY, Croft Farm, Hessay, York
H. C.—708, 709, 710 712. C.—723, 724, 725

¹ Special Prize given by the White Orpington Club for the best White Orpington Cockerel in Class 424

² Special Prize given by the White Orpington Club for the best White Orpington Pullet in Class 425

³ Special Prize of 10s. given by the Black Orpington Club for the best Black Orpington in Classes 426-429.

⁴ Special Prize of 10s. given by the Blue Orpington Club for the best Blue Orpington Cock or Cockerel in Class 430.

⁵ Special Prize of 10s. given by the Blue Orpington Club for the best Blue Orpington Hen or Pullet in Class 431.

⁶ Silver Spoon given by the British Rhode Island Red Club for the best British Rhode Island Red in Classes 434-437.

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Class 435. British Rhode Island Red Hens [20 entries]

- 731 I. (30s.)—H BAKEWELL Seabrooks Road Somerbyotes Alfreton
740 II. (20s.)—J W BARRA, Appleton Wiske Northallerton
750 III. (10s.)—JOHN WILLIAMSON Park House Knaresborough
748 R. N. W F MCGIBBON, Burnside Rollaston on Dove Burton on Trent
H. C.—733 734, 735 O.—741 742 745

Class 436.—British Rhode Island Red Cockerels [22 entries]

- 754 I. (30s.)—JOHN WILLIAMSON Park House Knaresborough
767 II. (20s.)—MRS A SWINGLER Smalley Hall Derby
760 III. (10s.)—A SWEIL Royal Oak House Levins Minthorpe
752 R. N.—W R ABBEY Croft Farm, Hessay, York
H. C.—762, 766 O.—750 757

Class 437.—British Rhode Island Red Pullets [20 entries]

- 780 I. (30s. & R. N. for Champion¹)—JOHN WILLIAMSON, Park House Knaresborough
777 II. (20s.)—R MARSH Swanwick, Alfreton
775 III. (10s.)—W F MCGIBBON Burnside, Rollaston on Dove, Burton on Trent
790 R. N.—H BAKEWELL Seabrooks Road Somerbyotes Alfreton
H. C.—783, 784, 785 787 O.—771 786

Class 438.—Mahogany Russian Orloff Cocks or Cockerels [9 entries]

- 802 I. (30s.)—MRS W B GOODE Aldborough Lodge Boroughbridge
806 II. (20s.) & 800 III. (10s.)—MRS CHRISTINE COLBECK, Boyle Hall, West Ardsley,
Wakefield
807 R. N.—MRS ANTHONY WILSON, Braithwaite, Keswick

Class 439.—Mahogany Russian Orloff Hens or Pullets [9 entries]

- 815 I. (30s.) & 817 R. N.—MRS CHRISTINE COLBECK, Boyle Hall, West Ardsley,
Wakefield
812 II. (20s.)—H HUNKIN Oringall Poultry Farm, Neth
814 III. (10s.)—H THORNTON Rycroft Holey, Huddersfield
H. C.—808, 811 O.—813

Class 440.—Old English Game Black-Red Cocks or Cockerels [11 entries]

- 820 I. (30s.) & 831 II. (20s.)—T C HEATH, Keele, Newcastle Staffs
823 III. (10s.)—J T DODD, The Wath Farm, Silloth
830 R. N.—ALICE S AGNEW, Heawood Hall, Chelford
H. C.—820, 826

Class 441.—Old English Game Clay or Wheaten Hens or Pullets
[9 entries]

- 839 I. (30s.)—R S MARSDEN, Pendle Hotel, Clitheroe
840 II. (20s.)—ALICE S AGNEW Heawood Hall, Chelford
835 III. (10s.)—MAJOR SMITH Edinborough Hall, Doncaster
832 R. N.—WALTER FIRTH, Read, Blackburn
H. C.—833, 838 O.—831

Class 442.—Old English Game Cocks or Cockerels, any other colour
[12 entries]

- 850 I. (30s.)—T C HEATH Keele Newcastle Staffs
847 II. (20s.)—J B CROMPTON Woodhaven St George's Hill Weybridge
841 III. (10s.)—WALTER FIRTH, Read Blackburn
846 R. N.—TOM GARNER, Abbey Town Carlisle
H. C.—844, 845, 849 851 O.—852

Class 443.—Old English Game Hens or Pullets, any other colour [15 entries.]

- 863 I. (30s.)—T C HEATH Keele Newcastle Staffs
861 II. (20s.)—R S MARSDEN, Pendle Hotel, Clitheroe
854 III. (10s.)—W MESSENGER Mill Hill Mill, Whitehaven
853 R. N.—TOM WOODCOCK Burton Fen Lincoln
H. C.—855, 857, 858 859, 865 O.—862 866

Class 444.—Indian Game Cocks or Cockerels. [10 entries.]

- 872 I. (30s.)—ALFRED BURCH Edge Farm, Setton, via Seaforth Liverpool
875 II. (20s.) & 877 III. (10s.)—J R BAKER & SONS, The Forge, Barnatople
876 R. N.—O H BURTON, Great Longstone, Derbyshire
H. C.—868, 874 O.—870, 871

¹ Silver Spoon given by the British Rhode Island Red Club for the best *Rhode Island Red* in Classes 434-437

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Class 445.—*Indian Game Hens or Pullets.* [9 entries.]

- 886 I. (30s.), & 884 III. (10s.)—J. H. BAKER & SONS, The Forge, Barnstaple.
 881 II. (20s.)—WALTER FIRTH, Read, Blackburn.
 878 R. N.—ALFRED BIRCH, Edge Farm, Sefton, via Seaforth, Liverpool.
 H. C.—879, 883, 885. C.—880.

Class 446.—*Modern Game Cocks or Cockerels, any colour.* [6 entries.]

- 890 I. (30s.)—R. S. MARSDEN, Pendle Hotel, Clitheroe.
 891 II. (20s.)—WALTER FIRTH, Read, Blackburn.
 887 III. (10s.)—DAVID WISHART, The Ferry, Chatteris.
 892 R. N.—C. SNEDDON, Ribby Road, Kirkham.
 H. C.—888. C.—889.

Class 447.—*Modern Game Hens or Pullets, any colour.* [5 entries.]

- 897 I. (30s.), & 895 III. (10s.)—WALTER FIRTH, Read, Blackburn.
 896 II. (20s.)—C. SNEDDON, Ribby Road, Kirkham.
 894 R. N.—C. W. BRIERLEY, Brookside, Brimfield.
 H. C.—893.

Class 448.—*Black Sumatra Game Cocks or Cockerels.* [8 entries.]

- 899 I. (30s.)—F. R. EATON, Cleveland House, Eaton, Norwich.
 905 II. (20s.)—MRS. WINSLOE, Dunsdale, Frodsham.
 898 III. (10s.)—MISS E. SPARROW, Ardencaple, Leamington Spa.
 900 R. N.—H. C. COLEBROOKE, The Homestead, Pinchunt Road, Westmoors, Wimbome.
 H. C.—902. C.—901, 903.

Class 449.—*Black Sumatra Game Hens or Pullets.* [8 entries.]

- 908 I. (30s.)—T. W. E. ROYDEN, Flegg Burgh, Norfolk.
 906 II. (20s.)—MISS E. SPARROW, Ardencaple, Leamington Spa.
 911 III. (10s.)—F. R. EATON, Cleveland House, Eaton, Norwich.
 913 R. N.—MRS. WINSLOE, Dunsdale, Frodsham.
 H. C.—907, 909, 910. C.—912.

Class 450.—*Minorca Cocks or Cockerels.* [8 entries.]

- 914 I. (30s.), & 920 II. (20s.)—WALTER BRADLEY, Homelea Poultry Farm, Silsden, Yorks.
 916 III. (10s.)—JOHN SAUNDERS, High Lane Farm, Ecclesall.
 919 R. N.—J. T. FARRAR & SON, Ivy Cottage, Beauchief, Sheffield.
 H. C.—921.

Class 451.—*Minorca Hens or Pullets.* [16 entries.]

- 931 I. (30s.), & 936 II. (20s.)—WALTER BRADLEY, Homelea Poultry Farm, Silsden, Yorks.
 923 III. (10s.)—J. SAUNDERS, High Lane Farm, Ecclesall.
 925 R. N.—V. A. PEARSON, 128 Oakland Road, Sheffield.
 H. C.—924, 929, 932, 933, 935, 937.

Class 452.—*White Leghorn Cocks or Cockerels.* [12 entries.]

- 938 I. (30s.), & 941 II. (20s.)—WALTER BRADLEY, Homelea Poultry Farm, Silsden, Yorks.
 948 III. (10s.)—C. H. BRITTON, Great Longstone, Derbyshire.
 943 R. N.—W. F. MCGIBBON, Burnside, Rolleston-on-Dove, Burton-on-Trent.
 H. C.—944.

Class 453.—*White Leghorn Hens or Pullets.* [8 entries.]

- 950 I. (30s.), & 953 II. (20s.)—WALTER BRADLEY, Homelea Poultry Farm, Silsden, Yorks.
 955 III. (10s.)—W. F. MCGIBBON, Burnside, Rolleston-on-Dove, Burton-on-Trent.
 956 R. N.—C. H. BRITTON, Great Longstone, Derbyshire.
 H. C.—952, 954.

Class 454.—*Brown Leghorn Cocks or Cockerels.* [4 entries.]

- 959 I. (30s.)—JOHN JONES, Poultry Farm, Crymmych Arms, Pembrokeshire.
 960 II. (20s.)—M. NICHOLS, Central Police Station, Warrington.
 958 III. (10s.)—E. ANTHONY, Home Farm, Euxton, Chorley, Lancs.
 961 R. N.—MRS. LLOYD, Leaton Knolls, Shrewsbury.

Class 455.—*Brown Leghorn Hens or Pullets.* [10 entries.]

- 964 I. (30s.), & 967 III. (10s.)—W. POTTS, 3 Lowfield Road, Stockport.
 965 II. (20s.)—J. H. ANTHONY, 36 Denmark Road, Churchtown, Southport.
 971 R. N.—W. H. SMITH & SON, Peets Farm, Southport.
 H. C.—962, 968, 969, 970. C.—963.

Class 456. *Black Leghorn Cocks or Cockerels.* [5 entries.]

- 976 I. (30s.)—WALTER BRADLEY, Homestead Poultry Farm, Salsdon, Yorks.
 973 II. (20s.)—A. H. THORP, 3 Grange Park Road, Thornton Heath.
 972 III. (10s.)—H. WHITEOAK, (Grange, Kildwick, Keighley.
 975 R. N.—F. RINKS, Bellfield Poultry Yards, Rochdale.
 H. C.—971.

Class 457. *Black Leghorn Hens or Pullets.* [16 entries.]

- 984 I. (30s.)—A. & W. TAYLOR, Old Cross, Glossop.
 983 II. (20s.)—WALTER HURST, Royle Pen, Glossop.
 981 III. (10s.)—R. S. MARSDEN, Pendle Hotel, Clitheroe.
 980 R. N.—WHITAKER & TOOTILL, Quarry Farm, Poole, Leeds.
 H. C.—980, 985, 987. G.—978, 981, 988.

Class 458. *Blue Leghorn Cocks or Cockerels.* [5 entries.]

- 993 I. (30s. & Champion¹)—MISS ALEXANDER, Stockwell House, Knarborough.
 994 II. (20s.)—H. SCHOFIELD, Stone-wood, Delph, Oldham.
 995 III. (10s.)—R. & J. W. QUIBELL, 9 Church Street, Hooley Hill, Manchester.

Class 459. *Blue Leghorn Hens or Pullets.* [7 entries.]

- 1003 I. (30s. & R. N. for Champion¹), & 998 R. N.—MISS ALEXANDER, Stockwell House, Knarborough.
 1001 II. (20s.)—FRED MABSEY, 207 Olive Lane, Durwen.
 999 III. (10s.)—R. & J. W. QUIBELL, 9 Church Street, Hooley Hill, Manchester.

Class 460. *Leghorn Cocks or Cockerels, any other colour.* [3 entries.]

- 1005 I. (30s.)—A. R. FISH, Holme Mead, Hutton, Preston.
 1007 II. (20s.)—L. W. ADAMS, Red Barns Farm, Fareham.
 1006 III. (10s.)—A. CASS, Yates Brow Farm, Pickering.

Class 461. *Leghorn Hens or Pullets, any other colour.* [3 entries.]

- 1008 I. (30s.) & 1010 II. (20s.)—L. W. ADAMS, Red Barns Farm, Fareham.

Class 462. *Sicilian Buttercup Cocks or Cockerels.* [8 entries.]

- 1017 I. (30s. & Champion²), & 1018 II. (20s. & R. N. for Champion²)—MRS CHRISTINE COLBROCK, Boyle Hall, West Ardley, Wakefield.
 1014 III. (10s.)—MISS F. CHAMPION, Heather Hall, Ashby-de-la-Zouch.
 1015 R. N.—MRS. ANTHONY WILSON, Braithwaite, Keewick.
 H. C.—1013.

Class 463. *Sicilian Buttercup Hens or Pullets.* [11 entries.]

- 1020 I. (30s. & Champion²), & 1023 II. (20s. & R. N. for Champion²)—E. J. GEE, Cannon Mill, Chesham.
 1026 III. (10s.)—MRS. ANTHONY WILSON, Braithwaite, Keewick.
 1021 R. N.—MISS F. CHAMPION, Heather Hall, Ashby-de-la-Zouch.

Class 464. *Barred Plymouth Rock Cocks.* [20 entries.]

- 1038 I. (30s. & R. N. for Champion²)—DR. E. S. JACKSON, Robin Hill, Garslorth.
 1040 II. (20s.)—C. SNEDDON, Ribby Road, Kirkham.
 1037 III. (10s.)—JAMES BATEMAN, Minthorpe.
 1031 R. N.—W. S. SANDERSON, Brooks Cottage, Barnacre, Garslorth.
 H. C.—1030, 1033, 1035, 1039, 1017. G.—1011, 1013.

Class 465. *Barred Plymouth Rock Hens.* [11 entries.]

- 1055 I. (30s. & Champion²)—R. GARLICK, Kirkby Lonsdale.
 1051 II. (20s.)—DR. E. S. JACKSON, Robin Hill, Garslorth.
 1058 III. (10s.)—SYDNEY LAKE, Haycosen, Tonbridge.
 1050 R. N.—LORD LEITH OF FYVIE, Home Farm, Fyvie, N.B.
 H. C.—1058. G.—1057.

Class 466. *Barred Plymouth Rock Cockerels.* [11 entries.]

- 1075 I. (30s.)—C. SNEDDON, Ribby Road, Kirkham.
 1069 II. (20s.)—DR. E. S. JACKSON, Robin Hill, Garslorth.
 1066 III. (10s.)—R. GARLICK, Kirkby Lonsdale.
 1064 R. N.—LORD LEITH OF FYVIE, Home Farm, Fyvie, N.B.
 H. C.—1065, 1068. G.—1074, 1076.

¹ Special Prize given by the Blue Leghorn Club for the best Blue Leghorn in Classes 456 and 459.

² Special Prize given by the International Buttercup Club for the best Cock or Cockerel in Class 462.

³ Special Prize given by the International Buttercup Club for the best Hen or Pullet in Class 463.

⁴ Special Prize, given by the Barred Plymouth Rock Club for the best Barred Plymouth Rock in Classes 464-467.

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Class 467.—*Barred Plymouth Rock Pullets.* [11 entries.]

- 1079 I. (30s.), & 1083 III. (10s.)—DR. E. S. JACKSON, Robin Hill, Carnforth.
 1098 II. (20s.)—E. BILLINGTON, 16 Garstang Road, Wesham, Lancs.
 1090 R. N.—C. SNEEDON Ribby Road Kirkham.
 H. C. 1078, 1086. C.—1089, 1091.

Class 468.—*Buff Plymouth Rock Cocks or Cockerels.* [20 entries.]

- 1096 I. (30s.), & R. N. for Champion¹.—A. COWAP, Bowling Green, Little Leigh, Northwich.
 1103 II. (20s.)—ALEXANDER MARTIN, Mealbank Farm, Kendal.
 1098 III. (10s.)—MISS C. E. SHARDELOW, Linden House, Beccles.
 1111 R. N.—TOM H. FURNESS, Carlton House, Chesterfield.
 H. C.—1093, 1099, 1105 C.—1095, 1100, 1104.

Class 469.—*Buff Plymouth Rock Hens or Pullets.* [7 entries.]

- 1113 I. (30s.), & Champion¹, & 1117 II. (20s.)—HERBERT SPENSLEY, Oaks Farm, Menston, via Leeds.
 1112 III. (10s.)—DR. E. S. JACKSON, Robin Hill, Carnforth.
 1118 R. N.—W. Y. JEWELS, Hartfell House, Lymm, Cheshire.
 H. C.—1115. C.—1116.

Class 470.—*Plymouth Rock Cocks or Cockerels, any other colour.* [10 entries.]

- 1128 I. (30s.), & 1126 II. (20s.)—MRS. J. FARNHAM, Holdfast Poultry Farm, Haslemere.
 1120 III. (10s.)—O. H. DRYLAND, Jun. Ashwood, Cecil Street, Stubble, Littleborough.
 1124 R. N.—L. HODGSON, Woodleigh, Armthorpe, Doncaster.
 H. C.—1125, 1127. C.—1121.

Class 471.—*Plymouth Rock Hens or Pullets, any other colour.* [9 entries.]

- 1131 I. (30s.)—L. HODGSON, Woodleigh, Armthorpe, Doncaster.
 1133 II. (20s.), & 1129 R. N.—MRS. J. FARNHAM, Holdfast Poultry Farm, Haslemere.
 1130 III. (10s.)—R. THOMPSON The Lodge, Armside, via Carnforth.
 H. C.—1134. C.—1136.

Class 472.—*Scots Dumpy Cocks or Cockerels.* [8 entries.]

- 1145 I. (30s.), 1143 III. (10s.), & 1140 R. N.—JOHN MAJOR, Ditton, Langley, Bucks.
 1138 II. (20s.)—JAMES W. BROWN, Skellyton Farm, Larkhall, Lanarkshire.
 H. C.—1141. C.—1142.

Class 473.—*Scots Dumpy Hens or Pullets.* [13 entries.]

- 1151 I. (30s.), & 1157 II. (20s.)—JAMES W. BROWN, Skellyton Farm, Larkhall.
 1148 III. (10s.), & 1156 R. N.—JOHN MAJOR, Ditton, Langley, Bucks.
 H. C.—1150 C.—1153.

Class 474.—*Ancona Cocks or Cockerels.* [12 entries.]

- 1109 I. (30s.), & 1167 II. (20s.)—JAMES H. HEAP, Bay Horse Hotel, Worsthorne, Burnley.
 1108 III. (10s.)—MR. & MRS. HURT, South Darley, Matlock.
 1163 R. N.—WILLIAM NELSON, Jubilee Holes Bar, Baxenden, Accrington.
 H. C.—1159, 1160, 1161, 1162, 1165. C.—1161, 1166.

Class 475.—*Ancona Hens or Pullets.* [10 entries.]

- 1175 I. (30s.), & 1178 II. (20s.)—JAMES H. HEAP, Bay Horse Hotel, Worsthorne, Burnley.
 1174 III. (10s.), & 1177 R. N.—JOSEPH EADSON, Park Hill, Ightenhill, Burnley.
 H. C.—1171, 1172, 1173, 1170, 1180 C.—1176.

Class 476.—*Yokohama Cocks or Cockerels.* [6 entries.]

- 1181 I. (30s.), & Champion², & 1184 II. (20s.)—R. SCOTT MILLER, Greenoak Hill, Broomhouse, Glasgow.
 1182 III. (10s.)—MRS. L. O. PRIDEAUX, Landfield, Haywards Heath.
 1183 R. N.—ROBERT L. MOND, Combe Bank, Sandridge, Sevenoaks.
 H. C.—1185

Class 477.—*Yokohama Hens or Pullets.* [6 entries.]

- 1189 I. (30s.), & R. N. for Champion², & 1191 R. N.—ROBERT L. MOND, Combe Bank, Sandridge, Sevenoaks.
 1187 II. (20s.), & 1190 III. (10s.)—R. SCOTT MILLER, Greenoak Hill, Broomhouse, Glasgow.
 H. C.—1192. C.—1188.

¹ Special Prize given by the Buff Plymouth Rock Club for the best Buff Plymouth Rock in Classes 468 and 469.

² Silver Medal given by the Yokohama Club for the best Yokohama in Classes 476 and 477.

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Class 478.—*Cocks or Cockerels, any other distinct variety except Bantams* [15 entries.]

- 1201 I. (30s.)—R. ANTHONY, Home Farm, Buxton, Chorley, Lancs. (Hamburgh.)
 1193 II. (20s.)—S. W. THOMAS, Glasfryn, Forest Fach, Swansea. (Houdan)
 1206 III. (10s.)—J. H. BAKER & SONS, The Forge, Barnstaple. (Malay.)
 1202 E. N.—THOMAS POYLE, Navile Royd, Hahtax. (Hamburgh.)
 H. C.—1186. C.—1191.

Class 479.—*Hens or Pullets, any other distinct variety except Bantams.* [19 entries.]

- 1226 I. (30s.)—W. H. SMITH & SON, Peets Farm, Southport. (Hamburgh.)
 1223 II. (20s.)—F. HITCHCOCK, Greenhill Lane, Alfreton. (Hamburgh.)
 1219 III. (10s.)—G. DU KWORTH, The Manor, Poulton-le-Fyde. (Andalusian)
 1217 E. N.—S. W. THOMAS, Glasfryn, Forest Fach, Swansea. (Houdan)
 H. C.—1214, 1216. C.—1208.

Class 480.—*Aylesbury Drakes or Ducks, bred prior to 1916.* [10 entries.]

- 1233 I. (30s.), & 1229 II. (20s.)—JAMES LONGSON & SONS, Buxton Road, Chapel-on-le-
 Frith.
 1231 III. (10s.)—MRS. E. WILSON, Meadow View, Marthall, Knutsford.
 1228 E. N.—REV. JOSEPH HEWETSON, Beeley Vicarage, Rowsley.
 H. C.—1227. C.—1234.

Class 481.—*Aylesbury Drakes or Ducks, bred in 1916.* [1 entry.]

- 1237 I. (30s.)—JAMES HUNTLY & SON, Hirsal Poultry Farm, Coldstream.

Class 482.—*Rouen Drakes or Ducks, bred prior to 1916.* [10 entries.]

- 1243 I. (30s.)—C. SNEDDON, Ribby Road, Kirkham.
 1246 II. (20s.)—F. A. NEWDEGATE, M.P., Arbury, Nuneaton.
 1243 III. (10s.)—R. ANTHONY, Home Farm, Buxton, Chorley, Lancs.
 1239 E. N.—REV. JOSEPH HEWETSON, Beeley Vicarage, Rowsley.
 H. C.—1241, 1244. C.—1240, 1245.

Class 483.—*Rouen Drakes or Ducks, bred in 1916.* [7 entries.]

- 1249 I. (30s.), & 1251 III. (10s.)—ALPH ALTY, Buckshaw Hall, Fuxton, Chorley, Lancs.
 1254 II. (20s.)—F. W. MYHILL, The Red House, Hethel, Norwich.
 1248 E. N.—F. A. NEWDEGATE, M.P., Arbury, Nuneaton.
 H. C.—1235.

Class 484.—*Indian Runner Drakes or Ducks, bred prior to 1916.* [6 entries.]

- 1260 I. (30s., & Champion¹), & 1256 II. (20s., & E. N. for Champion.¹) WILLIAM G.
 KINGWELL, Dartmoor Poultry Farm, South Brent, Devon.
 1257 III. (10s.)—R. ANTHONY, Home Farm, Buxton, Chorley, Lancs.
 1258 E. N.—LADY HARLEIGH, Brogyntyn, Oswestry.
 H. C.—1255.

Class 485.—*Indian Runner Drakes or Ducks, bred in 1916.* [5 entries.]

- 1261 I. (30s., & Champion²), & 1265 II. (20s., & E. N. for Champion.²) WILLIAM G.
 KINGWELL, Dartmoor Poultry Farm, South Brent, Devon.
 1263 III. (10s.)—LADY HARLEIGH, Brogyntyn, Oswestry.
 1264 E. N. MR. & MRS. HURT, South Darley, Mallock.
 H. C.—1262.

Class 486.—*Drakes or Ducks, any other variety bred prior to 1916.* [7 entries.]

- 1266 I. (30s.)—JAMES HUNTLY & SON, Hirsal Poultry Farm, Coldstream.
 1270 II. (20s.)—W. D. TRICKETT, Lench House, Waterfoot, Manchester.
 1267 III. (10s.)—WILLIAM G. KINGWELL, Dartmoor Poultry Farm, South Brent, Devon.
 1268 E. N.—R. O. P. BRADSHAW, Tinwell, Stamford
 H. C.—1271, 1272.

Class 487.—*Drakes or Ducks, any other variety bred in 1916.* [2 entries.]

- 1273 I. (30s.)—WILLIAM G. KINGWELL, Dartmoor Poultry Farm, South Brent, Devon.

¹ Special Prize of 10s. given by the Indian Runner Duck Club for the best Drake or Duck in Class 484.

² Special Prize of 10s. given by the Indian Runner Duck Club for the best Drake or Duck in Class 485.

Class 488.—*Emmden Ganders.* [4 entries.]

- 1275 I. (30s.)—LADY HARLEIGH, Brogyntyn, Oswestry.
1276 II. (20s.) & 1278 E. N.—ALFRED BIRCH, Edge Farm, Seiton, via Seaforth, Liverpool.
1277 III. (10s.)—J. SHELLY, Rolleston-on-Dove, Burton-on-Trent.

Class 489.—*Emmden Geese.* [6 entries.]

- 1282 I. (30s.) & 1281 III. (10s.)—ALFRED BIRCH, Edge Farm, Seiton, via Seaforth.
1279 II. (20s.)—J. SHELLY, Rolleston-on-Dove, Burton-on-Trent.
1281 E. N.—LADY HARLEIGH, Brogyntyn, Oswestry.

Class 490.—*Toulouse Ganders.* [5 entries.]

- 1287 I. (30s.)—F. HUTCHINSON, Spring Field House, Loftus-in-Cleveland.
1286 II. (20s.)—J. SHELLY, Rolleston-on-Dove, Burton-on-Trent.
1288 III. (10s.)—H. BICKFORD, Standeford, Four Ashes, Wolverhampton.
1289 E. N.—W. F. MCGIBBON, Burnside, Rolleston-on-Dove, Burton-on-Trent.

Class 491.—*Toulouse Geese.* [5 entries.]

- 1291 I. (30s.)—J. SHELLY, Rolleston-on-Dove, Burton-on-Trent.
1290 II. (20s.)—BARNES BROTHERS, Lancashire Poultry Farm, Wilpshire, Blackburn.
1292 III. (10s.)—F. HUTCHINSON, Spring Field House, Loftus-in-Cleveland.
1293 E. N.—H. BICKFORD, Standeford, Four Ashes, Wolverhampton.

Class 492.—*White Turkey Cocks or Cockerels.* [4 entries.]

- 1296 I. (30s.)—MISSSES RANSFORD, Penelva, Limpley Stoke, Bath.
1297 II. (20s.)—MRS. ANTHONY SPEDDING, Storms, Keswick.
1298 III. (10s.)—FRANK MAY, Houndwood, Radlett, Herts.

Class 493.—*White Turkey Hens or Pullets.* [5 entries.]

- 1302 I. (30s.)—LADY HARLEIGH, Brogyntyn, Oswestry.
1300 II. (20s.)—MISSSES RANSFORD, Penelva, Limpley Stoke, Bath.
1303 III. (10s.)—FRANK MAY, Houndwood, Radlett, Herts.
1301 E. N.—MRS. A. SPEDDING, Storms, Keswick.
H. O.—1299

Class 494.—*Turkey Cocks, any other variety.* [4 entries.]

- 1306 I. (30s.)—ROBERT L. MOND, Combe Bank, Sundridge, Sevenoaks.
1304 II. (20s.)—GAGE HARPER, Macons Bridge, Raydon, Hadleigh, Suffolk.

Class 495.—*Turkey Hens, any other variety.* [2 entries.]

- 1309 I. (30s.)—THOMAS ABBOT, Wymondham, Norfolk.
1308 II. (20s.)—F. A. NEWDEGATE, M.P., Arbury, Nuneaton.

Class 496.—*Sebright Bantam Cocks or Cockerels.* [11 entries.]

- 1313 I. (30s.)—J. C. PRESTON, Bay House, Ellil, Lancaster.
1310 II. (20s.) & 1320 III. (10s.)—REV. W. SERJEANTSON, Acton Burnell Rectory, Shrewsbury.
1318 E. N.—A. R. FISH, Holme Mead, Hutton, Preston.
H. O.—1317. O.—1315.

Class 497.—*Sebright Bantam Hens or Pullets.* [17 entries.]

- 1323 I. (30s.)—J. C. PRESTON, Bay House, Ellil, Lancaster.
1333 II. (20s.)—A. R. FISH, Holme Mead, Hutton, Preston.
1328 III. (10s.)—F. HEARY, Brooklyn, Warfield, Bracknell, Berks.
1337 E. N.—REV. W. SERJEANTSON, Acton Burnell Rectory, Shrewsbury.
H. O.—1331. O.—1321.

Class 498.—*Wyandotte Bantam Cocks or Cockerels.* [11 entries.]

- 1339 I. (30s.)—W. & J. HEYS, Stone Croft, Leftwich Green, Northwich.
1344 II. (20s.) & 1340 E. N.—RAWSON & GURZON, Fritchley, Ambergate, Derbyshire.
1345 III. (10s.)—J. W. & H. WATERHOUSE, Wyandotte Poultry Farm, Glossop.
H. O.—1338. O.—1346.

Class 499.—*Wyandotte Bantam Hens or Pullets.* [8 entries.]

- 1353 I. (30s.) & 1356 III. (10s.)—E. WHITAKER, Carrs Farm, Wadsworth, Hebden Bridge.
1350 II. (20s.)—J. F. ENTWISLE, The Firs, Calder Grove, Wakefield.
1355 E. N.—F. ROBINSON, Hoyalnd Common, Barnsley.
H. O.—1351. O.—1354.

Class 500.—*Scotch Grey Bantam Cocks or Cockerels.* [7 entries.]

- 1380 I. (30s.) & 1357 III. (10s.)—JAMES MCCRAE, 13 Thomson Street, Kilmarnock, N.B.
1359 II. (20s.)—JOHN D. JOINSTON, Norwood, Albert Avenue, Sedgley Park, Manchester.
1358 E. N.—THOMAS PATON, Orchard Street, Galston, N.B.
H. O.—1362. O.—1361.

Class 501. *Scotch Grey Bantam Hens or Pullets.* [6 entries.]

- 1365 I. (30s.). & 1369 III. (10s.)—JOHN D. JOHNSON, Norwood, Albert Avenue, Sedgley Park, Manchester.
1366 II. (20s.)—JAMES MCCRAE, 13 Thomson Street, Kilmarnock, N.B.
1364 E. N.—R. FLETCHER HEARNshaw, Fox Hill, Burton Joyce, Nottingham.
H. C.—1369. C.—1367.

Class 502.—*Old English Game Bantam Cocks or Cockerels.* [13 entries.]

- 1382 I. (30s.)—R. S. MARSDEN, Pendle Hotel, Clitheroe.
1380 II. (20s.)—E. WELLS, Boundry Bank, Kendal.
1379 III. (10s.)—J. PINCH & SON, Glabe Poultry Farm, St. Kew, Wadbridge.
1381 E. N.—W. MESSENGER, Mill Hill Mill, Whitehaven.
H. C.—1377. C.—1375.

Class 503.—*Old English Game Bantam Hens or Pullets.* [13 entries.]

- 1395 I. (30s.)—R. S. MARSDEN, Pendle Hotel, Clitheroe.
1389 II. (20s.), & 1388 III. (10s.)—T. & J. SPEIRS, Ye Olde Black Bull, Darvel, N.B.
1385 E. N.—MRS. A. K. COOPER, Beccford Road, Blackburn.
H. C.—1392. C.—1391.

Class 504.—*Modern Game Bantam Cocks or Cockerels, any colour.* [9 entries.]

- 1403 I. (30s.)—C. SNEDDON, Ribby Road, Kirkham.
1400 II. (20s.)—J. H. FLOYD, The Nab, Holnith.
1398 III. (10s.)—MASTER J. B. WAITON, Eden Cottage, Edenfield, Manchester.
1404 E. N.—W. D. TRICKETT, Lench House, Waterfoot, Manchester.
H. C.—1396. C.—1397.

Class 505.—*Modern Game Bantam Hens or Pullets, any colour.* [6 entries.]

- 1405 I. (30s.)—C. SNEDDON, Ribby Road, Kirkham.
1407 II. (20s.)—D. J. O. AIRD, Mount Charles Poultry Yards, Kilmarnock, N.B.
1409 III. (10s.)—T. H. HARTLEY, Holly Bank, Hipperholme, Yorks.
1408 E. N.—MRS. J. W. CARTER, The Croft, Fisherside Hill, Preston.
H. C.—1410. C.—1406.

Class 506.—*Black or White Rosecomb Bantam Cocks or Cockerels.* [1 entries.]

- 1412 I. (30s.)—G. L. BOOTH, Harrop Farm, Wilnden, Bradford.
1413 II. (20s.)—F. & O. ROBINSON, 3 Hardings Road, Keighley.
1411 III. (10s.)—A. R. FISH, Home Mead, Hutton, Preston.

Class 507.—*Black or White Rosecomb Bantam Hens or Pullets.* [7 entries.]

- 1415 I. (30s.)—A. R. FISH, Home Mead, Hutton, Preston.
1416 II. (20s.)—G. L. BOOTH, Harrop Farm, Wilnden, Bradford.
1418 III. (10s.)—CATHER & BOOTH, Seabrooks, Alfreton, Derbyshire.
1417 E. N.—F. & O. ROBINSON, 3 Hardings Road, Keighley.
H. C.—1420. C.—1421.

Class 508.—*Cochin or Pekin Bantam Cock, or Cockerels.* [8 entries.]

- 1424 I. (30s.)—A. HENSHAW, Norman Road, Ripley, Derby.
1423 II. (20s.)—F. & O. ROBINSON, 3 Hardings Road, Keighley.
1422 III. (10s.)—T. H. TURNER, North Bank Farm, Breachille, Burnley.
1426 E. N.—GEORGE H. LELAND, The Grange, Rochdale.
H. C.—1420.

Class 509.—*Cochin or Pekin Bantam Hens or Pullets.* [10 entries.]

- 1438 I. (30s.)—GEORGE H. LELAND, The Grange, Rochdale.
1433 II. (20s.)—F. & O. ROBINSON, 3 Hardings Road, Keighley.
1431 III. (10s.)—A. HENSHAW, Norman Road, Ripley, Derby.
1435 E. N.—RAWSON & CURZON, Fritchley, Amberley.
H. C.—1439. C.—1432.

Class 510.—*Yokohama Bantam Cocks or Cockerels.* [3 entries.]

- 1440 I. (30s., & Champion¹), & 1412 II. (20s.) F. J. S. CHATTERTON, 31 Elm Park Road, Finchley.
1441 III. (10s.)—MRS. L. C. PRIDEAUX, Landfield, Haywards, Heath.

Class 511.—*Yokohama Bantam Hen or Pullets.* [1 entries.]

- 1443 I. (30s., & E. N. for Champion¹), & 1416 II. (20s.) F. J. S. CHATTERTON, 31 Elm Park Road, Finchley.
1445 III. (20s.) R. SCOTT MILLER, Greenock Hill, Broomhouse, Glasgow.
1414 E. N.—MRS. L. C. PRIDEAUX, Landfield, Haywards, Heath.

¹ Silver Medal given by the Yokohama Club for the best Yokohama Bantam.

Award of Poultry Prizes at Manchester, 1916. cxxvii

Class 512.—*Japanese Bantam Cocks or Cockerels* [10 entries.]

- 1451 I. (30s.)—F. & O. ROBINSON, 3 Hardings Road, Keighley.
 1453 II. (20s.) & 1450 III. (10s.)—A. E. W. DAREY, Adcote, Shrewsbury.
 1452 R. N.—MRS. L. J. MINNIF, St Luke's Vicarage, Formby, Liverpool.
 H. C.—1418. C.—1456

Class 513.—*Japanese Bantam Hens or Pullets* [10 entries.]

- 1461 I. (30s.) & 1465 II. (20s.)—F. & O. ROBINSON, 3 Hardings Road, Keighley.
 1463 III. (10s.)—A. E. W. DAREY, Adcote, Shrewsbury.
 1459 R. N.—C. B. POWLS, West View, Burton Joyce, Nottingham
 H. C.—1458 C.—1466

Class 514.—*Bantam Cocks or Cockerels any other variety.* [6 entries.]

- 1467 I. (30s.)—W. R. BEER, Pill Farm, Barnstaple.
 1472 II. (20s.)—W. H. SMITH & SON Peets Farm, Southport.
 1468 III. (10s.)—E. J. SMITH, Monumental Works, Kirkheaton, Huddersfield.
 1469 R. N.—W. RUDDIMAN, Kirk Wynd, Cupar, Fife, N B
 C.—1471

Class 515.—*Bantam Hens or Pullets, any other variety.* [11 entries.]

- 1473 I. (30s.) J. F. ENFISLE, The Firs, Calder Grove, Wakefield
 1480 II. (20s.)—W. & J. HEYS Stonecroft, Leftwich Green, Northwich
 1476 III. (10s.)—C. B. POWLS, West View, Burton Joyce, Nottingham.
 1474 R. N.—E. J. SMITH, Monumental Works, Kirkheaton, Huddersfield.
 H. C.—1482 C.—1475

Pens for Table Purposes.¹

Class 516.—*First Cross, Indian Game and Dorking.* [6 entries.]

- 1489 I. (30s. & Champion. 2)—C. SNEDDON, Ribby Road, Kirkham.
 1488 II. (20s.)—R. ANTHONY, Home Farm, Euxton, Chorley, Lancs.
 1484 III. (10s.)—MAJOR H. WATTS, Brookdale, Alderley Edge, Cheshire.
 1487 R. N.—C. H. BRITTON, Great Longstone, Derbyshire.
 H. C.—1486. C.—1485

Class 517.—*First Cross, Indian Game and Buff Orpington.* [8 entries.]

- 1490 I. (30s. & R. N. for Champion. 2)—MAJOR H. WATTS, Brookdale, Alderley Edge.
 1491 II. (20s.)—C. H. BRITTON, Great Longstone Derbyshire.
 1492 III. (10s.)—R. ANTHONY, Home Farm, Euxton, Chorley, Lancs.

Class 518.—*First Cross, Indian Game, and any other pure breed.* [5 entries.]

- 1494 I. (30s.)—C. SNEDDON, Ribby Road, Kirkham.
 1495 II. (20s.)—MAJOR H. WATTS, Brookdale, Alderley Edge, Cheshire.

Class 519.—*Single Cockerels or Pullets production of any of the first crosses above mentioned.* [5 entries.]

- 1499 I. (30s.)—C. SNEDDON, Ribby Road, Kirkham.
 1501 II. (20s.)—MRS. J. FARNHAM, Holdfast Poultry Farm, Haslemere.
 1498 III. (10s.)—F. A. NEWDEGATE, M.P., Arbury, Nuneaton.
 1500 R. N.—MAJOR H. WATTS, Brookdale, Alderley Edge, Cheshire.
 H. C.—1502.

Class 520.—*Single Cockerels or Pullets, of any pure breed.* [17 entries.]

- 1509 I. (30s.)—WALTER BRADLEY, Homolen Poultry Farm, Silsden, Yorks.
 1503 II. (20s.)—ARTHUR C. MAJOR, Ditton, Langley, Bucks.
 1510 III. (10s.)—WILLIAM BRENT, Olampt, Cullington, Cornwall.
 1512 R. N.—C. & F. STEPHENSON, Burton House, Stafford.
 H. C.—1514, 1508. C.—1505.

¹ Prizes given by the Manchester Local Committee.

² Silver Cup given through the Manchester Local Committee for the best Breeding Pen in Classes 516, 517, and 518.

FARM AND DAIRY PRODUCE OF THE UNITED KINGDOM.

Butter.

Class 521.—*Two Pounds of Fresh Butter, without any salt, made up in plain pounds, from the milk of Channel Island, Devon, or South Devon Cattle and their crosses.* [17 entries.]

- 16 I. (£4.)—MRS. JOHN WAY, West Bridge, Bishopsnympton, South Molton, Devon.
- 10 II. (£2.)—MRS. L. R. MILDON, Mead Down, Ruckensford, Devon.
- 4 III. (£1.)—MRS. W. O. DUNKERLEY, Bowden View Farm, Mere, Knutsford.
- 14 R. N.—MRS. W. HOWARD PALMER, Murrell Park, Binfield, Berks.
H. C.—1, 15. C.—2, 6.

Class 522.—*Two Pounds of Fresh Butter, without any salt, made up in plain pounds, from the milk of Cattle of any breed or cross other than those mentioned in Class 521.* [11 entries.]

- 19 I. (£4.)—MRS. A. COOKSON, Primrose Hill, Kilsall, Chester
- 26 II. (£2.)—MRS. OXENHAM, Burntown, Tavistock.
- 23 III. (£1.)—MISS HEARN, Oakley, Horrabridge.
- 27 R. N.—MRS. MINNIE STOKES, Heddon House Dairy, Wylam-on-Tyne.
H. C.—24. C.—25.

Class 523.—*Two Pounds of Fresh Butter, slightly salted, made up in plain pounds, from the milk of Channel Island, Devon, or South Devon Cattle and their crosses.* [18 entries.]

- 48 I. (£4.)—MRS. JOHN WAY, West Bridge, Bishopsnympton, South Molton, Devon.
- 41 II. (£2.)—MRS. L. R. MILDON, Mead Down, Ruckensford, Devon.
- 40 III. (£1.)—MRS. JEROME, Bilton Hall, York
- 29 R. N.—MRS. A. A. BERE, Stoodleigh Barton, Tiverton.
H. C.—36, 45A. C.—32A, 35.

Class 524.—*Two Pounds of Fresh Butter, slightly salted, made up in plain pounds, from the milk of Cattle of any breed or cross other than those mentioned in Class 523.* [16 entries.]

- 57 I. (£4.)—MRS. OXENHAM, Burntown, Tavistock.
- 49 II. (£2.)—MRS. A. COOKSON, Primrose Hill, Kilsall, Chester.
- 53 III. (£1.)—MISS HEARN, Oakley, Horrabridge.
- 60 R. N.—MRS. MINNIE STOKES, Heddon House Dairy, Wylam-on-Tyne.
H. C.—54, 55. C.—48, 51.

Class 525.—*Three Pounds of Fresh Butter, slightly salted, made up in pounds in the most attractive marketable designs.* [11 entries.]

- 73 I. (£4.)—MRS. JOHN WAY, West Bridge, Bishopsnympton, South Molton, Devon.
- 69 II. (£2.)—MRS. L. R. MILDON, Mead Down, Ruckensford, Devon.
- 65 III. (£1.)—MRS. A. A. BERE, Stoodleigh Barton, Tiverton.
- 63 R. N.—MRS. A. COOKSON, Primrose Hill, Kilsall, Chester.
H. C.—84. C.—73.

Class 526.—*Three Pounds of Fresh Butter, slightly salted, made up in pounds, and packed in non-returnable boxes for transmission by rail or parcel post.* [7 entries.]

- 80 I. (£4.)—MRS. JOHN WAY, West Bridge, Bishopsnympton, South Molton, Devon.
- 75 II. (£2.)—MRS. L. R. MILDON, Mead Down, Ruckensford, Devon.
- 75 III. (£1.)—MRS. A. A. BERE, Stoodleigh Barton, Tiverton.
- 77 R. N.—MRS. FAITH HOLDEN, Nixons Farm, Dunne, Bolton.
H. C.—76. C.—74.

Cheese.

Made in 1916.

Class 527.—*Three Lancashire Cheeses, not over 12 lb. each.* [17 entries.]

- 96 I. (£4.)—GEORGE WHITAKER, Gibson's Farm, Kirkland, Garstang.
- 85 II. (£2.)—THOMAS E. BEE, Wham's Farm, Bay Horse, Lancaster.
- 93 III. (£1.)—JOHN SHORROCK, Stanley Farm, Roseacre, Kirkham.
- 82 R. N.—JOHN BEE, Bulsape Hall, Goosnargh, Preston.
H. C.—85, 90, 91. C.—84.

Class 528.—*Three Lancashire Cheeses, about 120 lb. in all, made on a farm of not exceeding 100 statute acres.* [14 entries.]

- 102 I. (£10.)—JAMES COWPE, The Treco, Goosnargh, Preston.
 100 II. (£5.)—THOMAS E. BEE, Wham's Farm, Bay Horse, Lancaster
 98 III. (£3.)—HUGH ALMOND, Mellings Farm, Catforth, Preston
 108 IV. (£2.)—EDWARD PROCTOR, Willacy House, Catforth, Preston.
 106 R. N.—JOHN PROCTOR, Lane Side Farm, Grimnargh, Preston
 H. O.—107. C.—99, 103.

Class 529.—*Three Lancashire Cheeses, about 120 lb. in all, made on a Farm exceeding 100 statute acres.* [6 entries.]

- 117 I. (£10.)—GEORGE WHITAKER, Gibson's Farm, Kirkland, Garstang.
 112 II. (£5.)—JOHN BEE, Bulsnape Hall, Goosnargh, Preston.
 114 III. (£3.)—WILLIAM KIRBY, Catforth Hall, Preston
 113 IV. (£2.)—THOMAS A. CROOK, Chesham House, Kirkham.
 115 R. N.—JOHN SHORROCK, Stanley Farm, Roseacre, Kirkham.
 O.—116.

Class 530.—*Three Cheshire Cheeses, Coloured, not over 40 lb. each.*
 [11 entries.]

- 127 I. (£10.)—G. WEST, Clatterdish Farm, Hurleston, Nantwich.
 119 II. (£5.)—SAMUEL DUTTON, Oak Farm, Haughton, Tarporley.
 118 III. (£3.)—TOM DENSON, Worleston, Nantwich
 125 R. N.—GEORGE PLATT, Eaton, Tarporley.
 H. O.—122, 120 C.—121

Class 531.—*Three Cheshire Cheeses, Coloured, over 40 lb. each.* [26 entries.]

- 145 I. (£10.)—W. R. LEA, Manor Farm, Hutherton, Nantwich.
 141 II. (£5.)—CHARLES F. HOBSON, Weston Hall, Eccleshall, Staffs.
 142 III. (£3.)—W. H. HOBSON, Blakenhall, Nantwich.
 129 IV. (£2.)—J. BIBBY & SONS, LTD., Hall o' Oole, Nantwich.
 134 R. N.—EDWIN COOKSON, Poulton, Wrexham.
 H. O.—138, 139, 143. C.—140, 147.

Class 532.—*Three Cheshire Cheeses, Uncoloured, not over 40 lb. each.*
 [12 entries.]

- 165 I. (£10.)—G. WEST, Clatterdish Farm, Hurleston, Nantwich.
 162 II. (£5.)—F. MITCHELL, Summer Hill Farm, Whitgreave, Stone, Staffs.
 158 III. (£3.)—W. HAMFSON, Whitgreave, Stone, Staffs.

Class 533.—*Three Cheshire Cheeses, Uncoloured, 40 lb. each.* [18 entries.]

- 176 I. (£10.)—JOSEPH JONES, New Farm, Dodleston, Chester.
 177 II. (£5.)—W. R. LEA, Manor Farm, Hutherton, Nantwich.
 172 III. (£3.)—WILLIAM DUTTON, Brindley Hall, Nantwich.
 175 IV. (£2.)—W. H. HOBSON, Blakenhall, Nantwich.
 178 R. N.—F. A. MOORE, The Grungo, Checkley, Nantwich.
 H. O.—179. C.—167, 173, 174.

Class 534.—*Three Cheddar Cheeses, not less than 50 lb. each.* [8 entries.]

- 191 I. (£5.)—S. T. WHITE, Forde Grange, Chard.
 192 II. (£3.)—ALEXANDER WYLLIE, Mowgat, Ayrshire.
 189 III. (£2.)—ROBERT STEVENSON, Boghead, Galston, Ayrshire.
 186 R. N.—ALEXANDER CROSS, Knockdon, Maybole, Ayrshire.
 H. O.—187. C.—185.

Class 535.—*Three Cheddar Truckles.* [8 entries.]

- 194 I. (£4.)—ALEXANDER CROSS, Knockdon, Maybole, Ayrshire.
 200 II. (£2.)—ALEXANDER WYLLIE, Mowgat, Ayrshire.
 196 III. (£1.)—ROBERT STEVENSON, Boghead, Galston, Ayrshire.
 199 R. N.—S. T. WHITE, Forde Grange, Chard.
 H. O.—193.

Class 536.—*Three Stilton Cheeses.* [8 entries.]

- 202 I. (£4.)—SAM FAIRBROTHER, Beeby, Leicester.
 207 II. (£2.)—HENRY MORRIS, Manor Farm, Saxelbye, Melton Mowbray
 205 III. (£1.)—WILLIAM JACKSON, Frisby House, Bilbosdon, Leicester.
 203 R. N.—GEORGE GOODBOURN, Nether Broughton, Melton Mowbray.
 H. O.—208.

Class 537.—*Three Wensleydale Cheeses, Stilton Shape.* [7 entries.]

- 212 I. (£4.) ALFRED ROWNFIRE, Coverham, Middleham.
 211 II. (£2.) MISS R. J. MUDD, Aldborough Dairy, Boroughbridge.
 209 III. (£1.) COLSTON BASSETT DISTRICT DAIRY, LTD., Bingham, Notts.
 214 R. N. MISS ANNIE WHIPP, Grinhall Farm, Walmsley, Bury.

Class 538.—*Three Small Cheeses, not exceeding 6 lb. each, of Cheddar or Cheshire Character.* [4 entries.]

- 219 I. (£3.) W. F. MOORE, Baddiley Farm, Nantwich.
 218 II. (£2.) COLSTON BASSETT DISTRICT DAIRY, LTD., Bingham, Notts.

Class 539.—*Three Small Cheeses, not exceeding 6 lb. each, of Stilton or Wensleydale Character.* [6 entries.]

- 220 I. (£3.) COLSTON BASSETT DISTRICT DAIRY, LTD., Bingham, Notts.
 224 II. (£2.) MRS. WALLS, Mount Pleasant Farm, Walmsley, Bury.
 221 III. (£1.) LONG CLAWSON DAIRY CO., LTD., Long Clawson, Melton Mowbray.
 222 R. N. MISS B. J. MUDD, Aldborough Dairy, Boroughbridge.
 C. -223.

Class 540.—*Three Soft Cheeses made from Whole Milk.* [5 entries.]

- 230 I. (£3.) MRS. O. A. SIMMONS, Pee Farm, Moretonhampstead, Devon.
 227 II. (£2.) LORAM BROS., Aylesbeare, near Exeter.

Class 541.—*Three Soft Cheeses made from Cream without the addition of Rennet.* [6 entries.]

- 231 I. (£3.) MRS. WILLIAM COOPER, Prize Dairy, Wollaton, Wellingborough.
 233 II. (£2.) LORAM BROS., Aylesbeare, near Exeter.

Bacon and Hams.¹**Class 542.**—*Two Sides of Bacon, pile dried, Wiltshire style, with Ham attached.* [4 entries.]

- 239 I. (£3.) LORD LUCAS, Wrest Park, Ampthill.
 237 II. (£2.) J. H. ISMAY, Iwerne Minster, Blandford.
 238 III. (£1.) LORAM BROS., Aylesbeare, near Exeter.

Class 543.—*Two Sides of Bacon, smoke-dried, Wiltshire style, with Ham attached.* [4 entries.]

- 242 I. (£3.) LORAM BROS., Aylesbeare, near Exeter.
 243 II. (£2.) LORD LUCAS, Wrest Park, Ampthill.
 241 III. (£1.) JAMES H. ISMAY, Iwerne Minster, Blandford.

Class 544.—*Two Sides of Bacon, pale dried, Wiltshire style, Hamless.* [3 entries.]

- 245 I. (£3.) JAMES H. ISMAY, Iwerne Minster, Blandford.
 240 II. (£2.) LORD LUCAS, Wrest Park, Ampthill.

Class 545.—*Two Sides of Bacon, smoke dried, Wiltshire style, Hamless.* [3 entries.]

- 248 I. (£3.) JAMES H. ISMAY, Iwerne Minster, Blandford.
 249 II. (£2.) LORD LUCAS, Wrest Park, Ampthill.

Class 546.—*Two Sides of Bacon, cured in the Cumberland style, Hamless.* [2 entries.]

- 251 I. (£3.) JOHN JOHNSON & SONS, Brickkiln Lane, Banks, Southport.

Class 547.—*Two Hams, pale dried, not exceeding 14 lb. weight.* [6 entries.]

- 255 I. (£3.) JOHN JOHNSON & SONS, Brickkiln Lane, Banks, Southport.
 258 II. (£2.) O. H. PALETHORPE, Dudley Port, St. As.
 254 III. (£1.) JAMES H. ISMAY, Iwerne Minster, Blandford.

¹ Classes 542-550 are open only to Breeders, who need not necessarily have cured their exhibits; and Classes 551-555 are open only to Curers, who need not necessarily have bred the animals from which the exhibits have been taken.

Class 548.—*Two Hams, smoke dried, not exceeding 14 lb. weight.* [4 entries.]

- 282 I. (£3.)—C. H. PALETHORPE, Dudley Port, Staffs.
 289 II. (£2.)—JAMES H. ISMAY, Iwerne Minster, Blandford.
 284 III. (£1.)—F. A. NEWDEGATE, M.P., Arbury, Nuneaton

Class 549.—*Two Hams, pale dried, exceeding 14 lb. weight.* [4 entries.]

- 283 I. (£3.)—JOHN JOHNSON & SONS, Brickkiln Lane, Banks, Southport.
 286 II. (£2.)—C. H. PALETHORPE, Dudley Port, Staffs.
 284 III. (£1.)—LORAM BROS., Ayle-beare, near Exeter.

Class 550.—*Two Hams, smoke dried, exceeding 14 lb. weight.* [4 entries.]

- 270 I. (£3.)—C. H. PALETHORPE, Dudley Port, Staffs.
 287 II. (£2.)—JAMES H. ISMAY, Iwerne Minster, Blandford.
 289 III. (£1.)—F. A. NEWDEGATE, M.P., Arbury, Nuneaton.

Class 551.—*Two Sides of Bacon, pale dried, Wiltshire style, with Ham attached.* [3 entries.]

- 271 I. (£3.)—HERTS. AND BEDS. BACON FACTORY, LTD, Hitchin.
 272 II. (£2.)—JAMES H. ISMAY, Iwerne Minster, Blandford
 273 III. (£1.)—T. MARSHALL & SON, Dore, Sheffield.

Class 552.—*Two Sides of Bacon, smoke-dried, Wiltshire style, with Ham attached.* [2 entries.]

- 275 I. (£3.)—JAMES H. ISMAY, Iwerne Minster, Blandford.
 274 II. (£2.)—HERTS. AND BEDS. BACON FACTORY, LTD, Hitchin

Class 553.—*Two Sides of Bacon, cured in the Cumberland style, Hamless.*
 [1 entry.]

- 277 I. (£3.)—T. MARSHALL & SON, Dore, Sheffield.

Class 554.—*Two Hams, pale dried.* [5 entries.]

- 280 I. (£3.)—JOHN JOHNSON & SONS, Brickkiln Lane, Banks, Southport.
 281 II. (£2.)—T. MARSHALL & SON, Dore, Sheffield.
 282 III. (£1.)—PALETHORPES, LTD., Dudley Port, Staffs.

Class 555.—*Two Hams, smoked dried.* [2 entries.]

- 285 I. (£3.)—PALETHORPES, LTD, Dudley Port, Staffs.
 283 II. (£2.)—HERTS. AND BEDS. BACON FACTORY, LTD., Hitchin.

Cider and Perry.

N.B.—The names of the Fruits from which the Cider or Perry is stated by the Exhibitor to have been made are added after the address of the Exhibitor.

Class 556.—*Casks of Dry Cider, not less than 9, and not more than 18 gallons, made in 1915.* [6 entries.]

C.—284.

Class 557.—*Casks of Sweet Cider, not less than 9, and not more than 18 gallons, made in 1915.* [9 entries.]

- 295 I. (£3. & R. N. for Champion) HERBERT J. DAVIS, Goldsborough House, Sutton Montis, Sparkford, Somerset. (Yarlington Mill, White and Ohisel Jersey, Kingston Black.)
 294 II. (£2.)—HERBERT J. DAVIS. (Royal and White Jerseys, Harry Masters, with few Cap of Liberty.)
 C.—293.

Class 558.—*Casks of Cider, not less than 9, and not more than 18 gallons, made previous to 1915.* [3 entries.]

[No award.]

Class 559.—*One Dozen Bottles of Dry Cider, made in 1915.* [10 entries.]

- 305 I. (£3.)—SIR IAN AMORY, BT., Knightshayes Court, Tiverton. (Mixed Fruit.)
 313 II. (£2.)—VICKERY BROS., Cider Works, Taunton (Kingston Black and Mixed.)

¹ Challenge Cup given by the Cider Growers of the West of England for the best exhibit of Cider in Classes 550-561.

Class 560.—*One Dozen Bottles of Sweet Cider, made in 1915.* [13 entries.]

- 316 I. (£3, & Champion¹), & 315 II. (£2).—**SIR IAN AMORY**, Bt, Knightsbridge Court, Tiverton. (Mixed Fruit)
 322 III. (£1).—**TILLEY BROS.**, Shepton Mallet (Red and White Jersey, Doves, and Bang Downs)
 325 E. N.—**VICKERY BROS.**, Cider Works, Trunton (Kingston Black and Mixed)
 H. C.—318. O. 314, 321

Class 561.—*One Dozen Bottles of Cider, made previous to 1915.* [7 entries.]

- 333 I. (£3).—**MRS. PHILIP WILLCOX**, Nupdown, Thornbury, Glos. (Kingston Black)
 331 II. (£2).—**HENRY ROBBINS & SON**, Ebley, Stroud (Mixed Fruit)
 328 III. (£1).—**HERBERT J. DAVIS**, Goldshotough House, Sutton Montis, Sparkford, Somerset. (White Close Pipins, Dove and Royal Jerseys Mixed, and few Kingston Black.)
 O.—329.

Class 562. *One Dozen Bottles of Dry Perry.* [2 entries.]

[No Award.]

Class 563.—*One Dozen Bottles of Sweet Perry.* [6 entries.]

- 338 I. (£3).—**HENRY MASON**, Withington, Hereford (Tavnton Squash.)
 339 II. (£2).—**HENRY ROBBINS & SON**, Ebley, Stroud (Bull.)
 O.—337.

Bottled Fruits and Vegetables.²

Class 564.—*Three Varieties of Fruit bottled in syrup, selected from Red or Yellow Plums, Greengages, Pears, Cherries and Raspberries.*
 [6 entries.]

- 342 I. (30s.).—**MRS. V. BANKS**, 102 Park Street, Grosvenor Square, London, W.
 345 II. (20s.).—**R. FLETCHER HEARNshaw**, Fox Hill, Burton Joyce, Nottingham.
 347 III. (10s.).—**G. W. WEATHERILL**, Belmont, Stokesley, Yorks.

Class 565.—*Six Varieties of Fruit bottled in water, selected from Red Plums, Yellow Plums, Victoria Plums, Greengages, Pears, Apricots, Damsons and Cherries.* [5 entries.]

- 348 I. (£3).—**MRS. V. BANKS**, 102 Park Street, Grosvenor Square, London, W.
 351 II. (£2).—**R. HOMER**, Allesley Village, Coventry.
 350 III. (£1).—**R. FLETCHER HEARNshaw**, Fox Hill, Burton Joyce, Nottingham.

Class 566.—*Six Varieties of Soft Fruit, bottled in water, selected from Gooseberries, Raspberries, Loganberries, Blackberries, Black Currants, Red Currants, Raspberries and Red Currants Mixed.* [3 entries.]

- 353 I. (£3).—**MRS. V. BANKS**, 102 Park Street, Grosvenor Square, London, W.
 355 II. (£2).—**MRS. M. R. FARLOUGH**, Croft, Darlington.
 354 III. (£1).—**R. HOMER**, Allesley Village, Coventry.

Class 567.—*Three Varieties of Fruit, bottled in water, selected from Red or Victoria Plums, Yellow Plums, Pears, Greengages, Damsons, and Cherries.*
 [8 entries.]

- 359 I. (30s.).—**MRS. ELIZABETH HALLAWAY**, 5 Devonshire Street, Carlisle.
 358 II. (20s.).—**W. H. FIELDHATE**, Ty Fry, Regent Road, Brighlington.
 362 III. (10s.).—**G. W. WEATHERILL**, Belmont, Stokesley, Yorks.

Class 568.—*Three Varieties of Soft Fruit, bottled in water, selected from Gooseberries, Raspberries, Loganberries, Blackberries, Black Currants, Red Currants, Raspberries and Red Currants mixed.* [7 entries.]

- 364 I. (30s.).—**ALFRED BIRCH**, Edge Farm, Sefton, via Senforth, Liverpool.
 370 II. (20s.).—**G. W. WEATHERILL**, Belmont, Stokesley, Yorks.
 369 III. (10s.).—**MISS POPE**, Bushley Lodge, New Milton, Hants.

¹ Challenge Cup given by the Cider Growers of the West of England for the best exhibit of Cider in Classes 560-561.

² Classes 564-568 and Class 573 were open to Amateurs. Classes 569-571 were open to Fruit Preservers. Class 572 was an open Class.

Class 569.—*Six Varieties of Fruit, bottled in syrup, selected from Peaches, Apples, Red or Yellow Plums, Greengages, Pears, Cherries, and Raspberries.*

[No entry.]

Class 570.—*Six varieties of Fruit bottled in water, selected from Red Plums, Yellow Plums, Victoria Plums, Greengages, Pears, Apples, Damsons and Cherries.*

[No entry.]

Class 571.—*Six Varieties of Soft Fruit, bottled in water, selected from Gooseberries, Raspberries, Loganberries, Blackberries, Black Currants, Red Currants, Raspberries and Red Currants mixed.*

[No entry.]

Class 572.—*Twelve Varieties of Fruit, bottled in water.* [1 entry.]

371 I. (£4.)—MRS V BANKS, 102 Park Street, Grosvenor Square, London, W.

Class 573.—*Three Varieties of Vegetables, bottled in water, selected from Peas, Broad Beans, Kidney Beans, and Asparagus.* [3 entries.]

372 I. (30s.)—MRS V. BANKS, 102 Park Street, Grosvenor Square, London, W.

373 II. (20s.)—R. HOMER, Allesley Village, Coventry.

374 III. (10s.)—MRS. M. E. PARLOUR, Croft, Darlington.

Wool.¹

Of 1916 Clip.

Class 574.—*Three Fleeces of Oxford Down Wool.* [9 entries.]

380 I. (£3), & 381 II. (£2.)—HUGH W. STILGOE, The Grounds, Adderbury, Banbury.

376 III. (£1.)—ALBERT BRASSEY, Heythrop Park, Chipping Norton.

H. C.—378.

C.—379.

Class 575.—*Three Fleeces of Southdown Wool.* [5 entries.]

387 I. (£3.)—LADY WERNHER, Luton Hoo, Luton.

385 II. (£2), & 386 III. (£1.)—THE EARL OF SUFFOLK AND BERKSHIRE, Charlton Park, Malmesbury.

H. C.—384.

Class 576.—*Three Fleeces of Hampshire Down Wool.* [1 entry.]

[No award.]

Class 577.—*Three Fleeces of Dorset Horn Wool.* [7 entries.]

394 I. (£3), 395 II. (£2), & 396 III. (£1.)—R. H. PALMER, West Stafford, Dorchester.

H. C.—391.

C.—393.

Class 578.—*Three Fleeces of Ryeland Wool.* [8 entries.]

404 I. (£3), & 405 II. (£2.)—DAVID J. THOMAS, Talachddu, Brecon.

401 III. (£1.)—MRS. HERBERT, Clytha Park, Abergavenny.

Class 579.—*Three Fleeces of Lincoln Long Wool.* [8 entries.]

410 I. (£3.)—THOMAS SPINK, Hunmanby, Yorks.

406 II. (£2.)—ANCELL B. HOLT, Home Farm, Sturton, Brigg.

409 III. (£1.)—HERBERT PEARS, Potterhanworth, Lincoln.

H. C.—408.

Class 580.—*Three Fleeces of Leicester Wool.* [5 entries.]

414 I. (£3), & 415 II. (£2.)—GEORGE HARRISON, Gainford Hall, Darlington.

416 III. (£1.)—JOHN W. HARRISON, Underpark, Lealholm, Gosmont.

Class 581.—*Three Fleeces of Border Leicester Wool.* [4 entries.]

418 I. (£3), & 419 III. (£1.)—G. F. BELL, Mildrum, Northumberland.

421 II. (£2.)—R. G. MURRAY & SON, Spittal, Biggar, N.B.

¹ The Second and Third Prizes in Classes 574-583 were given by the respective Flock Book Societies.

Class 582.—Three Fleeces of Wensleydale Blue-faced Wool. [6 entries.]

- 422 I. (£3), & 423 III. (£1.) LORD HENRY BENFINK, M.P., Underley Hall, Killybegs, Londale.
426 II. (£2.)—JOHN A. WILLIS, Manor House, Garpenby, Yorks
H. O.—424, 425.

Class 583.—Three Fleeces of Kent or Romney Marsh Wool, from Rams of any age. [1 entries.]

- 430 I. (£3.)—J. EGERTON (QUESTED, The Firs, Cheriton, Kent.
429 II. (£2.)—L. H. & G. W. FINN, Westwood Court, Faversham.

Class 584.—Three Fleeces of Kent or Romney Marsh Wool, excluding rams.
[8 entries.]

- 435 I. (£3.)—L. H. & G. W. FINN, Westwood Court, Faversham.
436 II. (£2.)—J. EGERTON (QUESTED, The Firs, Cheriton, Kent.
432 III. (£1.)—H. B. AMOS, Kipton, Ashford, Kent.
H. O.—434.

Class 585.—Three Fleeces of Cotswold Wool. [2 entries.]

- 440 I. (£3.)—W. T. GARNE & SON, Aldworth, Northleach.
441 II. (£2.)—MURTON & LONG, The Hall, Pudding Norton, Fakenham.

Class 586.—Three Fleeces of Dartmoor Wool. [1 entries.]

- 443 I. (£3), & 442 II. (£2.)—JOHN H. GLOVER, Cornwood, Devon.
444 III. (£1.)—W. A. JOHNS & SONS, Olave, Linton, Devon.

Class 587.—Three Fleeces of Exmoor Horn Wool. [2 entries.]
[No Award.]

Class 588.—Three Fleeces of Welsh Mountain Wool. [7 entries.]

- 448 I. (£3.)—H. O. ELLIS, Tynhendre, Bangor.
454 II. (£2.)—UNIVERSITY COLLEGE OF NORTH WALES, Aber, Bangor.
451 III. (£1.)—W. G. ROBERTS, Dyserth Hall, Dyserth.
H. O.—452 O.—449.

Class 589.—Three Fleeces of First Cross between Two Distinct Breeds of Short Wool. [6 entries.]

- 458 I. (£3), & 459 II. (£2.)—W. G. ROBERTS, Dyserth Hall, Dyserth, Southdown Ram and Welsh Ewe.
457 III. (£1.)—C. H. LLOYD EDWARDS, Nanhoron, Pwllhell, Southdown Ram and Welsh Ewe.
H. O.—460.

Class 590.—Three Fleeces of First Cross between Two Distinct Breeds of Long Wool. [2 entries.]

- 463 I. (£3), & 461 II. (£2.)—JOHN J. PIERSON, Tanton, Stokesley, Yorks. Lincoln Ram and Leicester Ewe.

Class 591.—Three Fleeces of First Cross of any Long and Short Wool.
[5 entries.]

- 463 I. (£3.)—GEORGE HARRISON, Guinford Hall, Darlington. Leicester Ram and Oxford Down Ewe.
464 II. (£2.)—WILLIAM HARRISON, Gamford, Darlington. Leicester Ram and Oxford Ewe.
467 III. (£1.)—JOHN J. PIERSON, Tanton, Stokesley, Yorks. Oxford Ram and Leicester Ewe.

Class 592.—Three Fleeces of First Cross of Pure-bred Sheep, of which one must be Mountain or Moorland. [5 entries.]

- 471 I. (£3.)—W. G. ROBERTS, Dyserth Hall, Dyserth. Southdown Ram and Welsh Ewe.
470 II. (£2.)—C. H. LLOYD EDWARDS, Nanhoron, Pwllhell, Southdown Ram and Welsh Ewe.
469 III. (£1.)—TOM LEATHERS, Wern Fawr, Ruthin. Southdown Ram and Welsh Ewe.

HIVES, HONEY, AND BEE APPLIANCES.¹

Class 5.—*Any appliances connected with Bee-keeping.* [1 entry.]

[No Award.]

Class 6.—*Comb Honey.*² [1 entry.]

10 II. (7s. 6d.)—A. S. DELL, County Apiaries, Leigh, Lancs.

Class 7.—*Light Extracted Honey.* [3 entries.]

13 I. (10s.)—P. M. RALPH, 2 Negh Hill Grove, Settle, Yorks.

12 II. (7s. 6d.)—J. JONES, 204 West Leigh Road, Leigh, Lancs.

11 III. (5s.)—A. S. DELL, County Apiaries, Leigh, Lancs.

Class 8.—*Medium and Dark Extracted Honey.* [2 entries.]

15 I. (10s.)—J. JONES, 204 West Leigh Road, Leigh, Lancs.

14 II. (7s. 6d.)—A. S. DELL, County Apiaries, Leigh, Lancs.

Class 9.—*Granulated Honey.* [3 entries.]

16 I. (7s. 6d.)—A. S. DELL, County Apiaries, Leigh, Lancs.

17 II. (5s.)—J. PIRKINGTON, Victoria Road, Thornton-le-Fylde, Lancs.

18 III. (2s. 6d.)—P. M. RALPH, 2 Negh Hill Grove, Settle, Yorks.

Class 10.—*Bee-swar.* [1 entry.]

19 II. (5s.)—A. S. DELL, County Apiaries, Leigh, Lancs.

Class 11.—*Comb Honey.*³ [4 entries.]

20 I. (15s.)—A. S. DELL, County Apiaries, Leigh, Lancs.

22 II. (10s.)—J. PEARMAN, Penny Long Lane, Derby.

21 III. (5s.)—G. MARSHALL, Norwell, Notts.

23 R. N.—STUDLEY HORTICULTURAL COLLEGE, Studley, Warwickshire.

Class 12.—*Extracted Light-coloured Honey.* [10 entries.]

24 I. (15s.)—W. J. COOK, Market Place, Binbrook, Lincs.

32 II. (10s.)—J. PEARMAN, Penny Long Lane, Derby.

33 III. (5s.)—STUDLEY HORTICULTURAL COLLEGE, Studley, Warwickshire.

25 R. N.—A. S. DELL, County Apiaries, Leigh, Lancs.

Class 13.—*Extracted Medium or Dark-coloured Honey.* [8 entries.]

38 I. (15s.)—T. MAR-HALL, Sutton-on-Trent.

41 II. (10s.)—STUDLEY HORTICULTURAL COLLEGE, Studley, Warwickshire.

39 III. (5s.)—J. PEARMAN, Penny Long Lane, Derby.

37 R. N.—G. MARSHALL, Norwell, Notts.

Class 14.—*Granulated Honey.* [10 entries.]

49 I. (15s.)—J. PEARMAN, Penny Long Lane, Derby.

48 II. (10s.)—W. F. JONES, Aberferan, Tybroes.

46 III. (5s.)—T. MARSHALL, Sutton-on-Trent.

51 R. N.—STUDLEY HORTICULTURAL COLLEGE, Studley, Warwickshire.

Class 15.—*Comb Honey.*⁴ [1 entry.]

52 I. (15s.)—G. J. FLASHMAN, Buckets Land Cottage, Holms Hill, Barnet.

¹ Owing to the exceptional circumstances caused by the war, the Exhibitors of previous years consented to exhibit in Classes 1-4 not for competition.

² Entries in Classes 6-10 could only be made by Members of the Lancashire Bee-keepers' Association.

³ Entries in Classes 11-14 can only be made by residents in Cheshire, Cumberland, Derbyshire, Durham, Herefordshire, Lancashire, Leicestershire, Lincolnshire, Monmouthshire, Northumberland, Nottinghamshire, Rutland, Shropshire, Staffordshire, Warwickshire, Westmorland, Worcestershire, Yorkshire, the Isle of Man, Ireland, Scotland, or Wales.

⁴ Entries in Classes 15-18 can only be made by residents in Bedfordshire, Berkshire, Buckinghamshire, Cambridgeshire, Cornwall, Devon, Dorset, Essex, Gloucestershire, Hampshire, Hertfordshire, Huntingdonshire, Isle of Wight, Kent, Middlesex, Norfolk, Northamptonshire, Oxfordshire, Somerset, Suffolk, Surrey, Sussex, or Wiltshire.

Class 16.—Extracted Light-coloured Honey. [3 entries.]

- 52A I. (15s.)—G. J. FLASHMAN, Buckets Land Cottage, Holms Hill, Barnet.
 54 II. (10s.)—S. C. S. LEIGH, The Nurseries, Broughton, Hants.
 53 III. (5s.)—W. J. GOODRICH, 20 Oxford Street, Gloucester.

Class 17.—Extracted Medium or Dark-coloured Honey. [2 entries.]

- 56 I. (15s.)—G. J. FLASHMAN, Buckets Land Cottage, Holms Hill, Barnet.
 55 II. (10s.)—G. BRYDEN, Star Hill, Rochester.

Class 18.—Granulated Honey. [5 entries.]

- 59 I. (15s.)—W. J. GOODRICH, 20 Oxford Street, Gloucester.
 58 II. (10s.)—G. BRYDEN, Star Hill, Rochester.
 58A III. (5s.)—G. J. FLASHMAN, Buckets Land Cottage, Holms Hill, Barnet.

Class 19.—Three Shallow Frames of Comb Honey, for extracting.
 [6 entries.]

[No Exhibits.]

Class 20.—Heather Honey. [4 entries.]

- 70 I. (15s.)—J. PEARMAN, Penny Long Lane, Derby.
 68 II. (10s.)—W. DIXON, 27 Central Road, Leeds.
 69 III. (5s.)—M. J. LAMBOLL, Chiddingfold, Surrey.
 67 E. N.—A. S. DELL, County Apiaries, Leigh, Lancs.

Class 21.—Heather Mixture Extracted Honey. [5 entries.]

- 74 I. (15s.)—J. PEARMAN, Penny Long Lane, Derby.
 71 II. (10s.)—A. S. DELL, County Apiaries, Leigh, Lancs.
 75 III. (5s.)—C. E. SMITH, 5 Mayfield Place, Sutton-in-Ashfield.
 72 E. N.—W. DIXON, 27 Central Road, Leeds.

Class 22.—Best and Most Attractive Displays of Honey in any form and of any year. [2 entries.]

- 76 I. (£1 5s.)—A. S. DELL, County Apiaries, Leigh, Lancs.
 77 II. (15s.)—J. PEARMAN, Penny Long Lane, Derby.

Class 23.—Exhibits of not less than 2 lb. of Beeswax, the Produce of the Exhibitor's Apiary. [6 entries.]

- 83 I. (7s. 6d.)—J. PEARMAN, Penny Long Lane, Derby.
 80 II. (5s.)—W. J. GOODRICH, 20 Oxford Street, Gloucester.
 82 III. (2s. 6d.)—T. MARSHALL, Sutton-on-Trent.
 81 E. N.—G. MARSHALL, Norwell, Notts.

Class 24.—Exhibits of not less than 3 lb. of Beeswax, the Produce of the Exhibitor's Apiary. [5 entries.]

- 88 I. (7s. 6d.)—J. PEARMAN, Penny Long Lane, Derby.
 85 II. (5s.)—F. W. FRUSHER, Now Road, Crowland, Peterborough.
 87 III. (2s. 6d.)—G. MARSHALL, Norwell, Notts.
 84 E. N.—W. DIXON, 27 Central Road, Leeds.

Class 25.—Honey Vinegar. [1 entry.]

- 89 I. (5s.)—STUDLEY HORTICULTURAL COLLEGE, Studley, Warwickshire.

Class 26.—Mead. [2 entries.]

- 90 I. (5s.)—J. PEARMAN, Penny Long Lane, Derby.
 91 II. (2s. 6d.)—STUDLEY HORTICULTURAL COLLEGE, Studley, Warwickshire.

Class 27.—Exhibits of a practical or interesting nature connected with Bee-culture. [1 entry.]

- 92 I. (5s.)—A. S. DELL, County Apiaries, Leigh, Lancs.

Class 28.—Exhibits of a scientific nature, not mentioned in the foregoing Classes. [1 entry.]

[No Award.]

FARMERS' MILK COMPETITION.

Open to Farmers supplying Milk to Manchester from the Counties of Lancashire and Cheshire.

Class 1.—*Farmers sending to Manchester 31 gallons of milk and upwards in two deliveries, morning and evening.* [59 competitors.]

I. (£6 6s.)—JOHN CLARKSON Blakeley Farm, Mobberley.

II. (£3 3s.)—JOSIAH WALKDEN, Sunny Bank Farm, Mobberley.

Certificates of Merit were awarded to Thomas Antwis, John James Bailey, Samuel Baigh, Edmund S. Bailey, Alfred J. Bastford, Herbert Beech, William Booth, Joseph Brindley, William Brookes, John Callwood, James Cooper, John Dale, John Dailington, J. F. Dean, Ernest Dooley, B. Dugdale & Son, James Faulkner, Peter Frith, S. J. Hague, Henry Hocknell, John T. Hocknell, William Hocknell, John R. Lowe, Thomas Massey, Isaac W. Mayer, W. H. Mayer, Edward Melling, Joseph Oliver, G. & W. Parker, John Payne, Randolph W. Platt, John Ravenscroft, Joseph Robinson, Ralph Seed, Fred. Steel, John J. Sproston, George Stamer, John Stanier, O. W. Tomkinson, William Vennables, Frank T. Walley, Harry Wallworth, John T. Webb, Thomas Wilkin-on, Albert N. Willis.

Class 2.—*Farmers sending to Manchester 15 to 30 gallons of milk in two deliveries, morning and evening* [8 competitors.]

I. (£4 4s.)—ALBERT LOMAS Breck Head, Brownside, Stockport.

II. (£2 2s.)—JOHN G. SHERWIN, Vale Farm, Tabley, Knutsford.

Certificates of Merit were awarded to Richard Foster, William Hudson, George Parker, F. R. Rowland, John B. Starkey, E. & P. Wild.

FLOWER SHOW.

Class 1.—*Groups of Miscellaneous Plants in and out of bloom.* [2 entries.]

1 I. (£30.)—JAMES CYPHER & SON, Cheltenham.

2 II. (£25.)—WILLIAM HOLMES, Chesterfield.

Class 2.—*Groups of Miscellaneous Plants in and out of bloom (Amateurs).*
[No entry.]

Class 3.—*Collections of Orchids, arranged for effect.* [1 entry.]

3 I. (£10.)—JAMES CYPHER & SON, Cheltenham.

Class 4.—*Collections of Delphiniums.* [1 entry.]

4 I. (£3.)—BLACKMORE & LANGDON, Twerton, Bath.

Class 5.—*Groups of Tuberous Begonias in Pots.* [1 entry.]

5 I. (£15.)—BLACKMORE & LANGDON, Twerton, Bath.

Class 6.—*Groups of Hardy Plants, Bamboos, Water Lilies and Aquatics, &c.*
[3 entries.]

7 I. (£20.)—WM. ARTINDALE & SON, Nether Green Nurseries, Sheffield.

8 II. (£15.)—G. GIBSON & CO., Leeming Bar, Bedale.

Class 7.—*Collections of Hardy Perennial Plants and Cut Blooms, Roses and Shrubs excluded.* [4 entries.]

9 I. (£20.)—W. & J. BROWN, Peterborough.

10 II. (£15.)—WM. ARTINDALE & SON, Nether Green Nurseries, Sheffield.

11 III. (£5.)—HARKNESS & SONS, Leeming Bar, Bedale.

11A R. N.—WHITELEGGE & CO.

Class 8.—*Collections of Cut Sprays of Carnations.* [1 entry.]

12 I. (£5.)—TANDEVIN & CO., Raby Flower Farm, Willaston, near Chester.

Class 9.—*Collections of Cut Roses.* [2 entries.]

13 I. (£5.)—W. & J. BROWN, Peterborough.

14 II. (£3.)—REV. J. H. REES, Helpringham Vicarage, Sleaford.

cxxxviii *Award of Prizes at Manchester, 1916.*

Class 10. —(Collections of Sweet Peas. [8 entries.]

- 22 I. (£7.)—ROBERT BOLTON, Warton, Carnforth.
19 II. (£5.) J. STEVENSON, Wimborne.
20 III. (£3.)—WILLIAM BOND, Farnby.
21 IV. (£2.)—ROBERT WRIGHT, Farnby.
16 R. N.—REV. J. H. REES, Holpringham Vicarage, Slenford.

Exhibits not for Competition.

Large Gold Medals to:—

ALEXANDER DICKSON & SONS, LTD., Newtownards, co. Down, for Sweet Peas.
ALEXANDER DICKSON & SONS, LTD., Newtownards, for Roses.
KING'S ACRE NURSERIES, LTD., Hereford, for Orchard House Trees in Fruit.
JOHN WATERER, SONS & CRISP, LTD., Bagshot, for Clipped Shrubs and Ornamental Evergreens, and Fine Conifers.

Gold Medals to:—

BROADHEAD & SON, Throgsbridge, Huddersfield, for Rockery Display.
B. R. CANT & SONS, Colchester, for Out Seedling Roses, and other kinds.
DOBBIE & CO., Edinburgh, for Sweet Peas.
GODFREY & SON, Exmouth, for Pelargoniums, &c.
JARMAN & CO., Chard, for Roses.
E. W. KING & CO., Coggeshall, Essex, for Sweet Peas.
STUART, LOW & CO., Kinsfield, for Roses, Orchids, and Carnations.
STUDLEY COLLEGE FOR WOMEN, Studley, Warwickshire, for Vegetables.

Silver-Gilt Medals to:—

W. ARTINDALE & SON, Nether Green Nursery, Sheffield, for Roses, Violas, and Out Flowers.
BATT, LTD., Wisbech, for Pæonies and Delphiniums.

Silver Medals to:—

W. EDWARDS Daybrook, Nottingham, for Table Decorations.
STUDLEY COLLEGE FOR WOMEN, Studley, Warwickshire, for Flowers and Fruit.

IMPLEMENTS.

Miscellaneous Implements.

'Silver Medals for articles entered as "New Implements for Agricultural or Estate Purposes."

208 ASTLEY PATENT Egg Box CO., Putney, London, S.W., for Egg Carrier.
1917 RICHMOND & CHANDLER, LTD., Globe Works, Manchester, for Hay Sweep, with patent elevating apparatus.

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